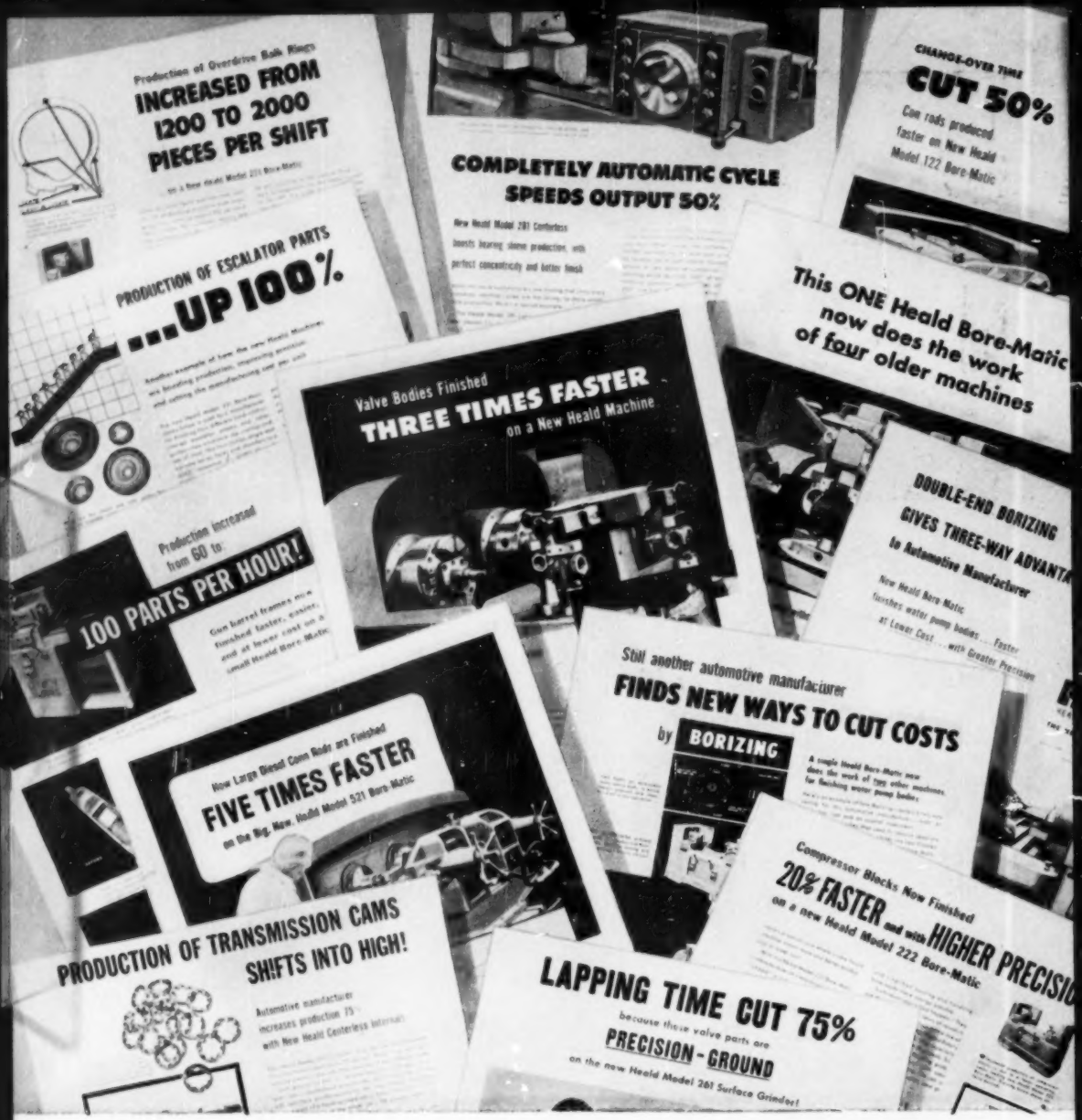
American Machinist

JANUARY 23, 1950

37TH ANNUAL REVIEW NUMBER

Picturing and describing almost 1500 items of new shop equipment, parts, and materials announced in 1949—plus the 1950 Appraisal of Metalworking


Production of Overdrive Ball Rings
INCREASED FROM 1200 TO 2000 PIECES PER SHIFT
COMPLETELY AUTOMATIC CYCLE SPEEDS OUTPUT 50%
CHANGE-OVER TIME
CUT 50%
Con rods produced faster on New Heald Model 122 Bore-Matic
PRODUCTION OF ESCALATOR PARTS ...UP 100%
This ONE Heald Bore-Matic now does the work of four older machines
Valve Bodies Finished
THREE TIMES FASTER
on a New Heald Machine
DOUBLE-END BORIZING GIVES THREE-WAY ADVANTA
to Automotive Manufacturer
Production increased from 60 to
100 PARTS PER HOUR!
Still another automotive manufacturer
FINDS NEW WAYS TO CUT COSTS
by BORIZING
How Large Diesel Conn Rods are Finished
FIVE TIMES FASTER
on the Big, New, Heald Model 521 Bore-Matic
Compressor Blocks Now Finished
20% FASTER and with HIGHER PRECISIO
on a new Heald Model 222 Bore-Matic
PRODUCTION OF TRANSMISSION CAMS SHIFTS INTO HIGH!
LAPPING TIME CUT 75%
because these valve parts are
PRECISION-GROUND
on the new Heald Model 261 Surface Grinder!

Savings like these can improve your production picture for 1950

Here are a few typical examples of what Heald engineering has done for others during the past year. Your precision finishing problems are different, of course. But chances are they offer the same opportunities for increasing production, improving product quality and cutting costs with new Heald machines.

Your nearest Heald representative will be glad to show you how to make the coming year a more profitable one.

HEALD

PRECISION INTERNAL AND SURFACE GRINDERS

PRECISION BORE-MATIC FINISHING MACHINES

THE HEALD MACHINE COMPANY

Worcester 6, Mass.

Branch Offices in Chicago • Cleveland • Dayton • Detroit
Indianapolis • Lansing • New York

American Machinist

MAGAZINE OF METALWORKING PRODUCTION

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James H. McGraw (1860-1948), Founder; James H. McGraw, Jr., President; Curtis W. McGraw, Vice-President and Treasurer; Eugene Duffield, Senior Vice-President, Publications Division; Nelson Bond, Vice-President and Director of Advertising; Joseph A. Gerardi, Secretary; J. E. Blackburn, Jr., Vice-President and Director of Circulation

Chips and Quips

Our Cover . . . In a simplified-sketch frieze, we have shown on our cover typical metalworking jobs. Each sketch represents a group of operations. They are, in order: forging, forming, casting, machining (two sketches), finishing (represented by electro-plating and painting), materials handling, and control (represented by a punched card) . . . During the war years, and for some time thereafter, metallic inks were not available. On this cover, however, we used two different ones.

Review . . . Almost 1500 descriptions of new shop equipment, materials and parts published during 1949 have been condensed here into a compact desk handbook of What's New in Metalworking. This exceeds last year's total by about a hundred items. We've followed our popular picture-and-caption custom to save your time, also varied ink color to identify major classifications. We hope you'll find it very useful all through 1950.

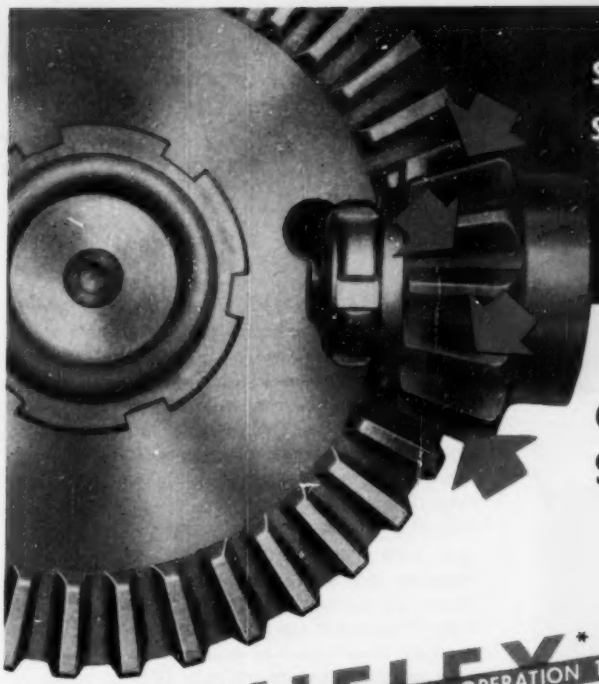
How to Use the Review . . . We've often thought we should punch the upper left corner of the Annual Review and put a string in it—to suggest to all of you that you keep it conveniently at hand. You'll find it includes everything new we could locate in 1949 for your use, and pictures those items which are better understood in picture than by words. All items are classified into three major divisions by color: machine tools and attachments (green); tools and accessories; forming, forging and casting; heat-treating and welding (brown); layout and inspection, cleaning and finishing, plant-service equipment, and parts and materials (blue). Each of these groups is further broken down by specific types, and subgroups are identified by corner labels. A contents page is provided at the start of the Review for quicker reference. Thus you can readily locate any type of equipment in which you are interested at any given time.

Statistics . . . This review issue brings you our annual statistical abstract, providing both data on 1949 operations and our forecast for 1950. Worthy of particular note is the change in the Metalworking Index, made necessary by a change in compilation of our base statistics from the Bureau of Labor Statistics. We also provide some additional summations from our Mid-Century Inventory and other indicative data. This "bonus" section makes editorial content in this issue twice that of the norm.

Gratifying . . . Speaking of the Mid-Century Inventory, there has been a response that really warms our editorial heart. We don't refer to the letters telling us how good or how impressive it was, though these exceed anything we have ever seen. What we really like is the concrete evidence, from many sources, that plants are making detailed studies of their competitive positions from the Inventory. Some have been startled to find they are not nearly as well off as they imagined and are working to replace their obsolete equipment. We all have seen cases of well-established companies that, as a result of complacency, have gone into a long decline ending in sale, merger, or bankruptcy. If this Inventory serves to awaken the management of just a few plants to the realities of their situation in time to save them from just such a decline, then those sleepless nights were well worth while.

Coming . . . Clad metals will be the subject of our Special Report for Feb. 6. Machining, forming and welding all will be covered. Articles will include the first of a series of three on boosting output of multi-slide presses, a production control setup for a small plant, fast setups for machining small die castings, scrap-strip allowances for blanking dies, application of transfer machines at Cadillac, proper use of resistance-welding equipment. Among shorts are the description of the U.S.-sponsored apprenticeships for foreign metal workers, application of air clamps to stenciling and a materials-handling trick worth knowing about. We'll also have our usual departments.

ASSISTANT . . . Robert W. Taylor was born in Los Angeles and received his BS in ME from the California Institute of Technology in October, 1945. He then put in a year as a deck officer on a troop transport on the Pacific Coast, before taking one year of graduate work in the Stanford University School of Journalism. Taylor next joined the editorial staff of the Napa *Daily Register*, covering two small towns from the newspaper's up-valley office. In November, 1948, he joined McGraw-Hill as an assistant editor of *Construction Methods*. He later worked on a trial issue of a new McGraw-Hill project, and has been with *American Machinist* since August, where he has been assisting with the Shop Equipment News column. The current Review is largely his work.

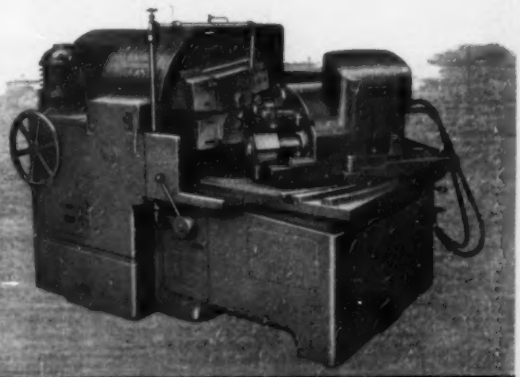


SUPERIOR
STRAIGHT BEVEL GEARS
WITH LOCALIZED
TOOTH BEARING

Cut on the Gleason No. 14 Straight Bevel Generator

CONIFLEX* GEARS
ARE SMOOTHER AND QUIETER IN OPERATION THAN ORDINARY STRAIGHT BEVELS.
CONIFLEX GEARS
HAVE ANY DESIRED AMOUNT OF LOCALIZATION OF TOOTH BEARING.
CONIFLEX GEARS
HAVE WIDER OPERATING TOLERANCES.
CONIFLEX GEARS
ARE EASIER TO ASSEMBLE.

Coniflex gears are produced on the Gleason No. 14 Straight Bevel Generator. Through simplified bearing control during gear manufacture, greater flexibility of the gears for assembly and for operation is obtained. With *controlled tooth bearing* the operator is able to build into every gear a tooth bearing which will carry the best possible operating advantage.



GLEASON *Works*
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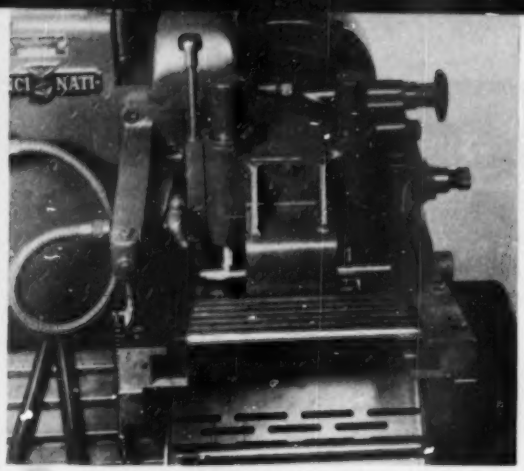
*Reg. U.S. Pat. Off.

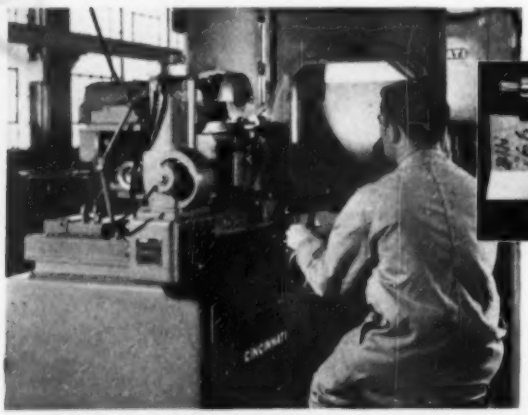
Builders of Bevel Gear Machinery for Over Eighty Years

We'd Like to Talk about



COMPLETELY AUTOMATIC—Milling Woodruff keyseats in generator shafts, on a new CINCINNATI No. 0-8 Automatic Rise and Fall Miller, at a production rate of 250 per hour.

DOWN-MILLING AND RAPID STOCK REMOVAL—Milling the top surface and slot (from the solid) of two cutter grinder tables at one time, removing 3/16" stock. Production nearly double with new CINCINNATI No. 5 Dual Power Dial Type.



UP TO FOUR TIMES FASTER—Grinding and inspecting simultaneously. Accurate form tool and die parts ground 30% to four times faster on new CINCINNATI Projecto-Form Grinding Machine.

Man's ability to earn a living, and industry's to cut costs and earn a profit, depend largely upon machine tools. Not obsolete machine tools fifteen, twenty or thirty years old, but the newest machine tools that do more and better work with less physical effort. Compared to the newest designs, the earning potential of machine tools only a few years old has gone downhill sharply. Consider these examples as proof of the cost cutting potential of new machine tools:

- A new CINCINNATI FILMATIC Micro-Centric Grinding Machine outproduces two prewar machines for grinding bearing races; cuts grinding costs 75%, and at the same time improves quality of sizing, roundness and squareness with one end. New machine investment only 58% of previous equipment for comparable production.
- Five diameters of a food mixer motor shaft are ground at the same time, on a CINCINNATI FILMATIC No. 2 Centerless Grinder. The machine is equipped with an automatic hydraulic infeed attachment and automatic magazine feed. Compared to the previous method of grinding these shafts on a center type machine, the cost has been reduced from five cents to one cent per shaft, saving about $9000 per machine in six months' time.
- A new CINCINNATI Tracer Controlled Hydromatic Milling Machine, tooled up to mill various sizes of turbine blades, reduced the time per blade from 480 minutes to 25 minutes.
- Glass molds, machined complete on a CINCINNATI 8" x 18" Tool and Die Miller, now require only a fraction of the hand finishing formerly required. Additional savings are realized in the copy milling

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9,

MILLING MACHINES • BROACHING MACHINES
FLAME HARDENING MACHINES
CUTTING FLUID • CENTER TYPE GRINDING
CENTERLESS GRINDING MACHINES

to You Cutting Costs

operation; now 18 hours compared to the former method which required 28 hours.

● A progressive manufacturer of motors broaches the feet of motor frames on a CINCINNATI No. 5-54 Single Ram Vertical Hydro-Broach. One fixture accommodates four sizes of frames; cost reduced 40% over previous method.

● Small sizes of CINCINNATI knee-type milling machines—Nos. 2ML and 2MI—are capable of taking up to 25% heavier cuts than their predecessors; handling and set-up time is 15 to 25% faster. In the largest sizes—Nos. 5 and 6 Dual Power Dial Type—cutting capacity has been increased 50 to 75%; handling and set-up time cut 35 to 40%.

Case histories like those cited here are commonplace for machine tools bearing the Cincinnati Milling or Cincinnati Filmatic trade-marks. A few more are illustrated at the left and right.

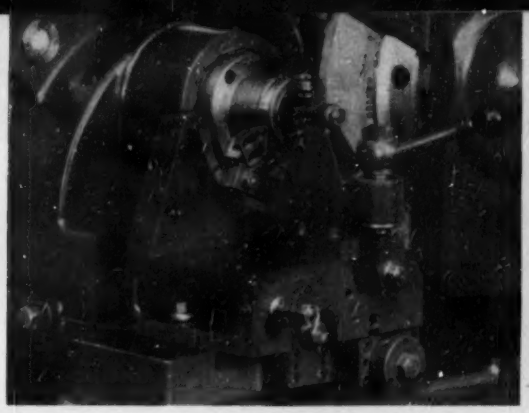
Why not bring your machining problem to us? Our nearest sales representative or direct field engineer will gladly help you. Better still, come with them to Cincinnati for a real cost cutting conference. We can help you cut your costs.

In all, there are 34 standard design types of Cincinnati Milling, Grinding and related machine tools, built in over 300 sizes and styles. CINCINNATI FILMATIC Grinders handle work ranging from .004" diameter up to solid steel rolls 60" diameter, 15,000 times as large, and 665,000,000 times as heavy. Cincinnati Milling Machines mill parts ranging in size from ¼" to 47' long. There's a Cincinnati for your type of work in the fields of: MILLING • BROACHING • CUTTER SHARPENING • DIESINKING • GRINDING • CENTERLESS LAPPING • FLAME HARDENING. Write for a copy of our general catalog, publication No. M-1684.

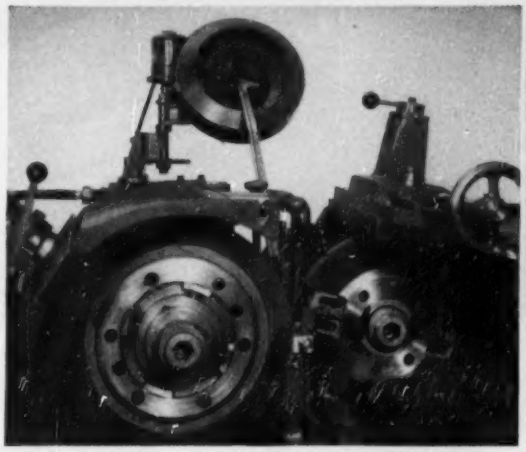
CINCINNATI GRINDERS INCORPORATED

OHIO, U. S. A.

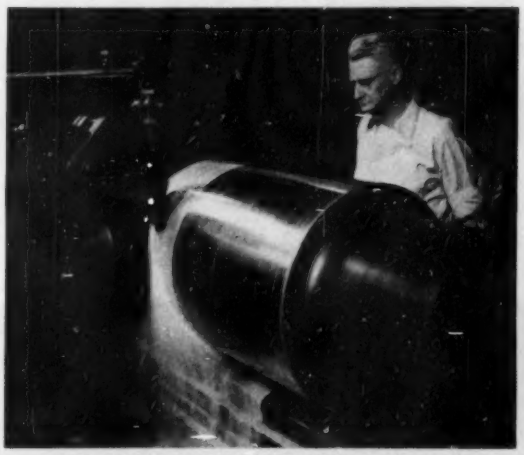
CUTTER SHARPENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS
MACHINES • CENTERLESS LAPPING MACHINES
MICRO-CENTRIC GRINDING MACHINES



COSTS CUT 75%—New CINCINNATI FILMATIC Micro-Centric Grinding Machine, grinding bearing races at the rate of 125 per hour, outperforms two prewar machines in both quality and production.

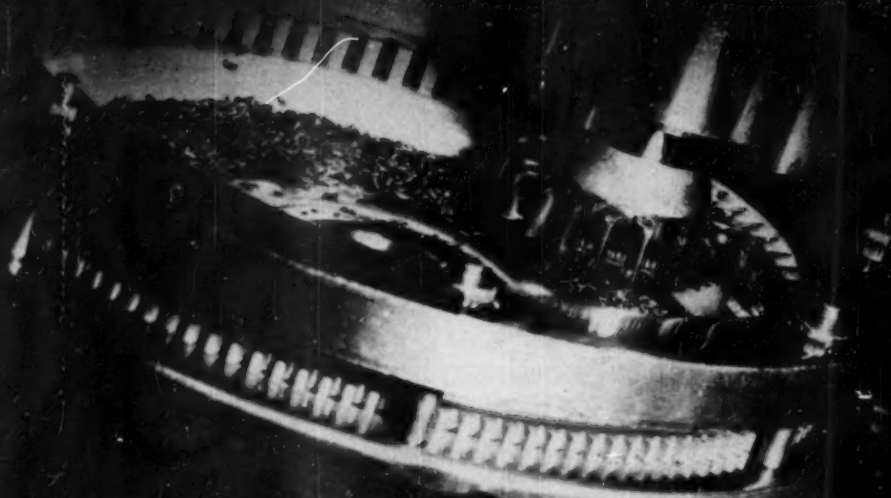


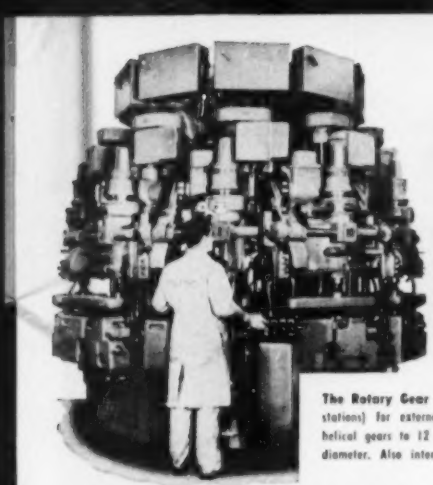
1200 PER HOUR—Hard rubber feed tips are ground at the rate of 1200 per hour on a new CINCINNATI FILMATIC No. 2 Centerless Grinder employing a new principle of infeed grinding—cammed regulating wheel.



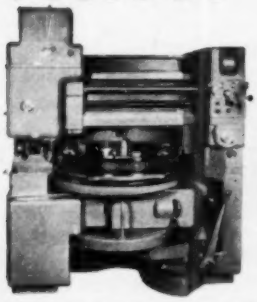
MAINTENANCE CHARGES DECLINE SHARPLY—This new CINCINNATI FILMATIC 24" x 96" Roll Grinding Machine will require little maintenance in the years to come. Filmatic bearings, automatic way lubrication and electronic table traverse control assure dependability.

GOOD GEARS





FELLOWS GEAR-



The Rotary Gear Shaper (10 stations) for external spur and helical gears to 12 inches pitch diameter. Also internals.

The Planetary Gear Shaper (6 work-spindles) for external spur and helical gears and pinions to 3½ inches pitch diameter.

The 36-inch Heavy-Duty Gear Shaper for intermediate and large size gears, and face widths up to 6 inches.

The 3-inch Fine Pitch Gear Shaper for small external and internal spur and helical gears. Often with magazine feed.

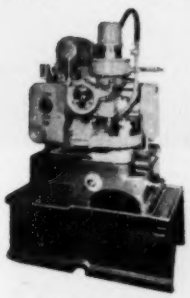
THE FELLOWS GEAR SHAPER COMPANY, Head Office & Export Dept., Springfield, Vermont.
Branch Offices: 616 Fisher Bldg., Detroit 2, Mich. • 640 West Town Office Bldg., Chicago 12, Ill. • 7706 Empire State Bldg., New York 1, N. Y.

. . . . cheaper to produce with FELLOWS' LATEST

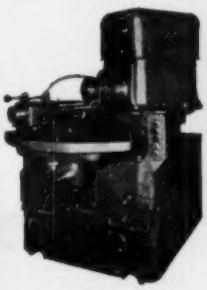
The late-model Fellows Machines offer the gear shop a major production advantage over older-type tooling. Increased stock-removal-capacity is offered in the large, medium and small machines, alike. Finer finish is achieved through still greater rigidity of work and tool relationship. Operating attendance costs come down with the rising importance of multiple-spindle machines.

Coordinated gear production operations may involve any combination of the machines and instruments shown below. Literature is available on all types. An inquiry addressed to the office nearest you will bring up-to-the-minute information of any kind, either general or specific.

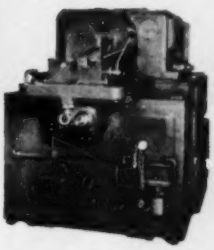
CUTTING ★ SHAVING ★ INSPECTION



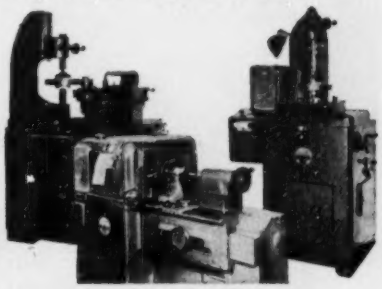
The 7-Type Gear Shapers for general service on external and internal spur and helical gears up to 7 inches.



The Full-Tool Shaving Machine for finishing external spur and helical gears up to 8 inches pitch diameter.



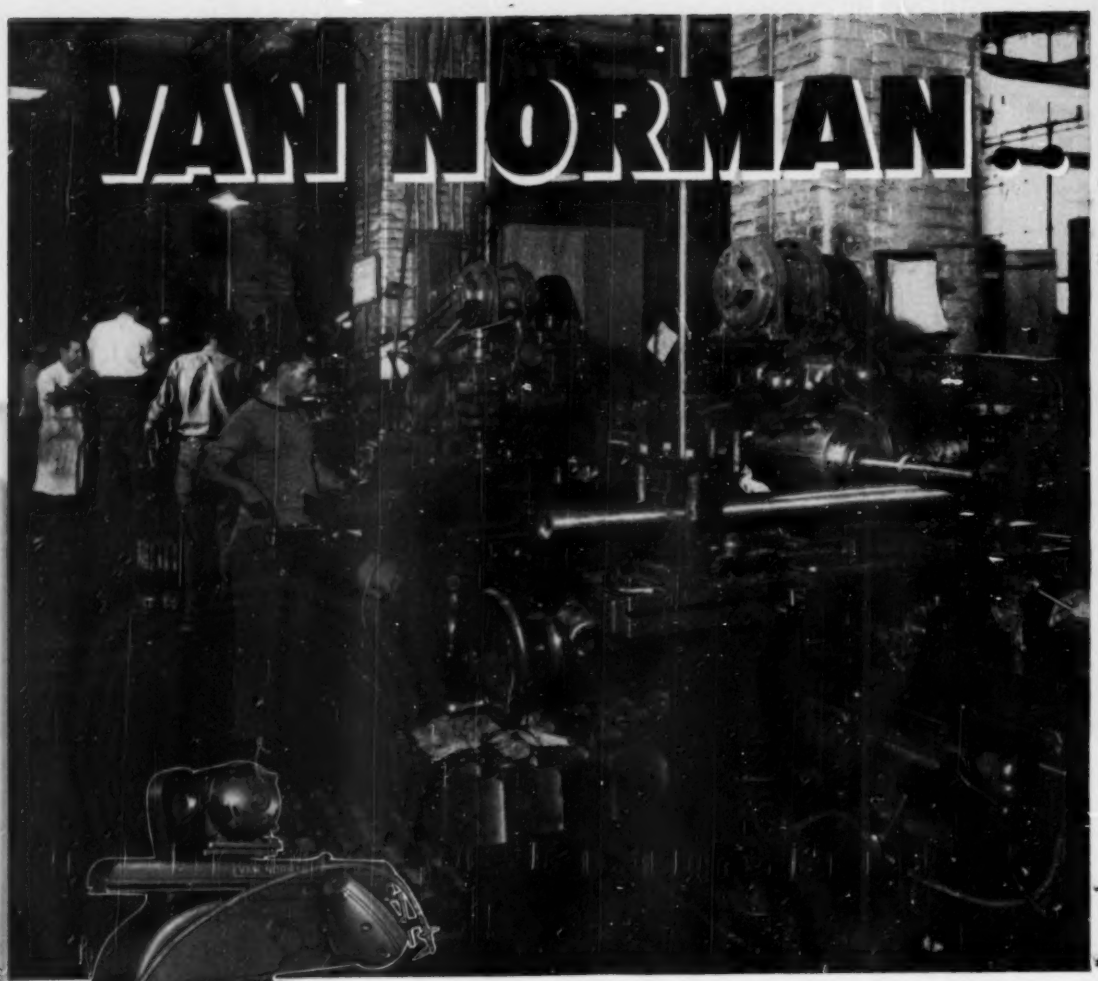
The No. 11 Gear Shaving Machine for finishing internal gears, both spur and helical, capacity dependent upon tool and fixtures.



The Inspection Instruments for (a) Involute measuring of tooth profiles (b) Lead measuring for the checking of lead, crown, and taper (c) "Rod Liner" for inspection of errors in combination. All instruments are provided with automatic recording devices.

Fellows

VAN NORMAN



No. 26
Table: 58" x 13"
Over 16 other models available . . .
A size for every application.

HORIZONTAL MILLING

Ram Type Millers

Increase Milling Capacity

Adjustable Cutterhead Permits One Machine to do the Work of Three

Conventional horizontal, vertical or angular milling . . . all with one machine . . . that's what you get with a Van Norman Ram Type Miller.

All you need do is position the adjustable cutterhead in the desired cutting position and you are ready for the cut. In addition to its versatility, the ram type miller reduces work set-up time to a minimum because many jobs can be carried through to completion without re-setting up of the work piece.

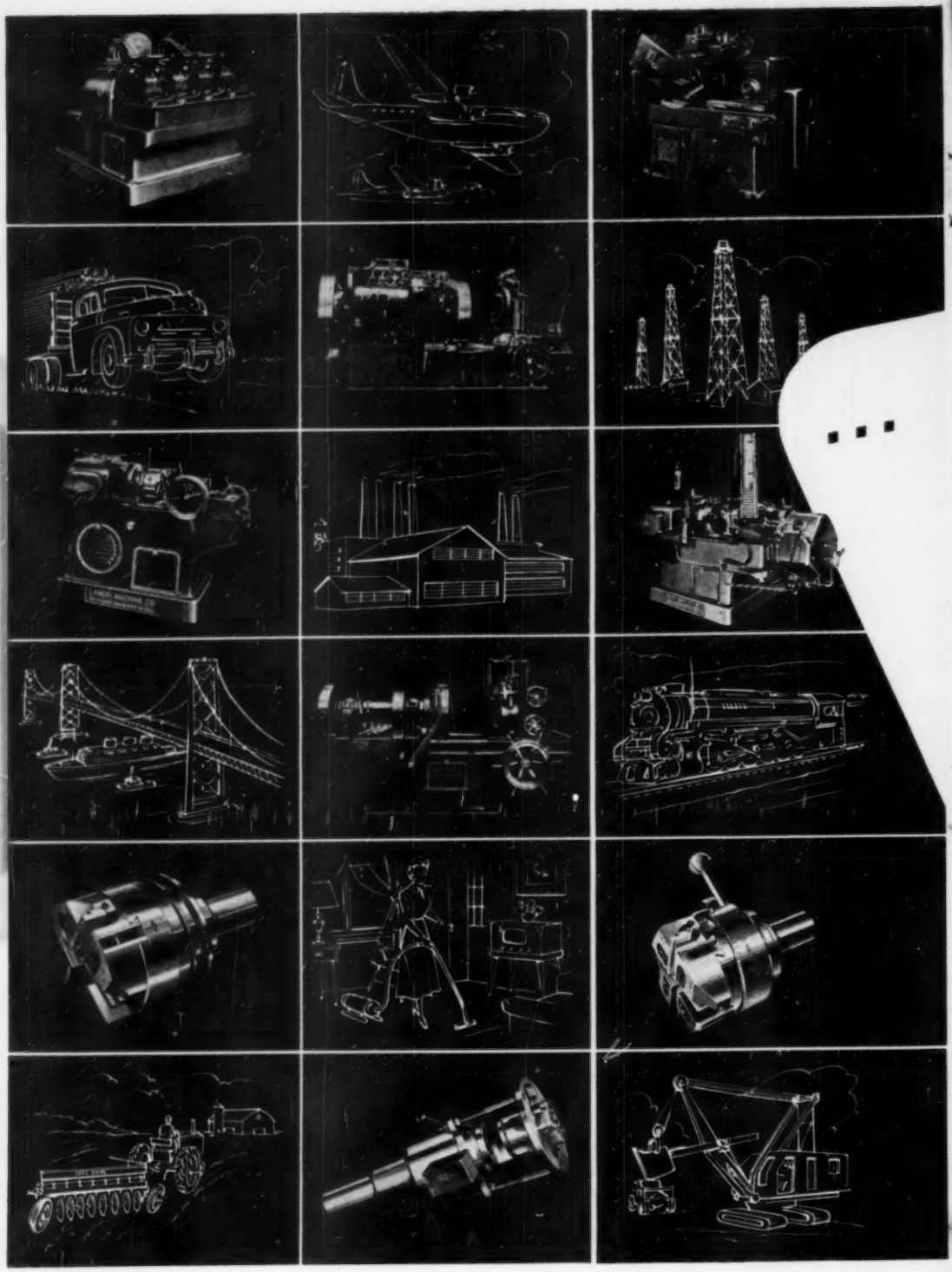
Van Norman Ram Type Millers are easy to operate. Front and rear controls permit operation from either location. Hardened and ground steel fixed cutterhead stops permit true settings at horizontal or vertical position. The rugged construction throughout assures accuracy and long operating life.

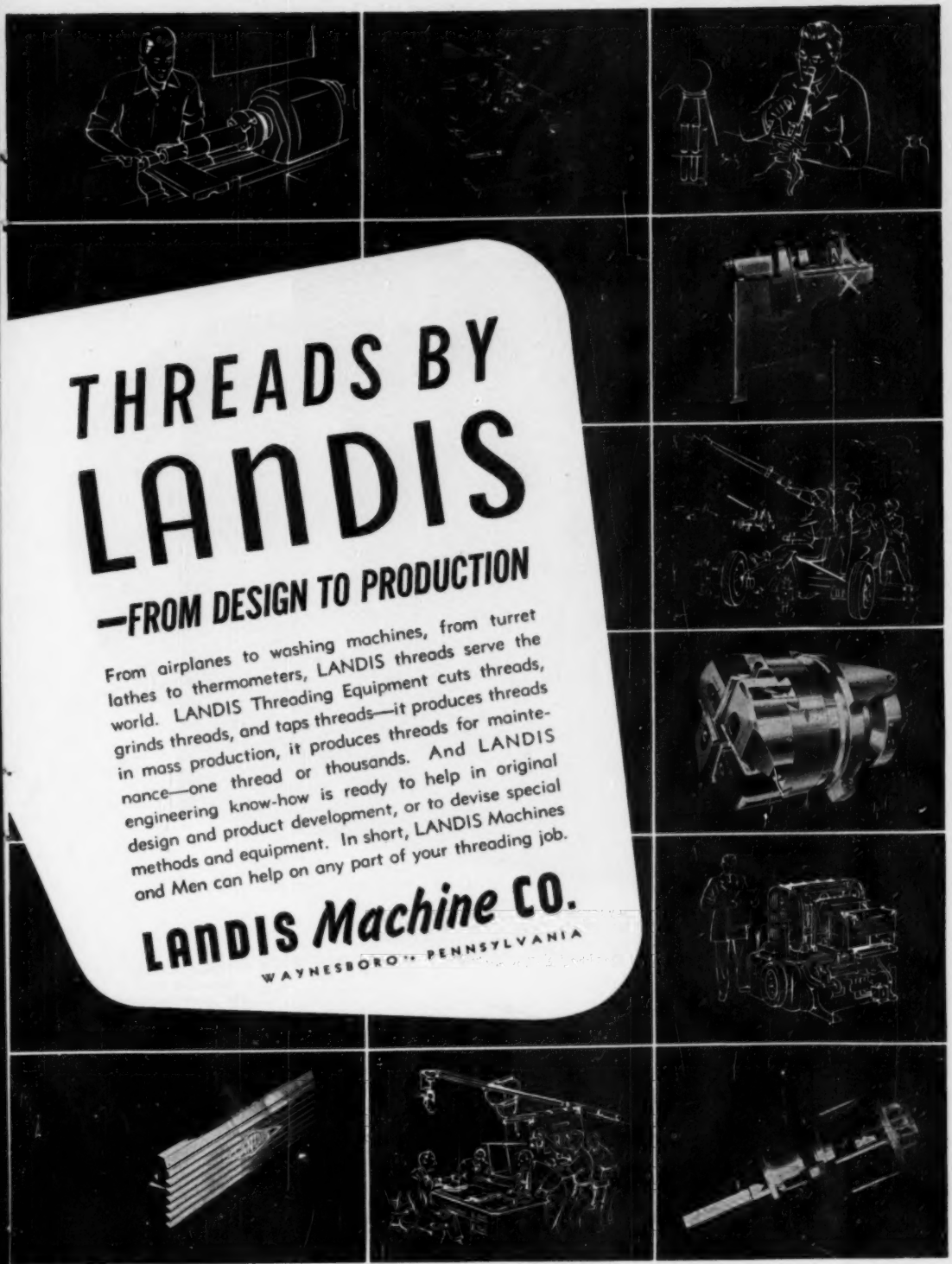
Investigate Van Norman Ram Type Milling Machines for toolroom, laboratory, pattern and die work and production milling. It will cut costs, increase production. Write for catalog.

VAN NORMAN COMPANY

SPRINGFIELD 7, MASSACHUSETTS

"It pays to Van Normanize"





THREADS BY LANDIS

—FROM DESIGN TO PRODUCTION

From airplanes to washing machines, from turret lathes to thermometers, LANDIS threads serve the world. LANDIS Threading Equipment cuts threads, grinds threads, and taps threads—it produces threads in mass production, it produces threads for maintenance—one thread or thousands. And LANDIS engineering know-how is ready to help in original design and product development, or to devise special methods and equipment. In short, LANDIS Machines and Men can help on any part of your threading job.

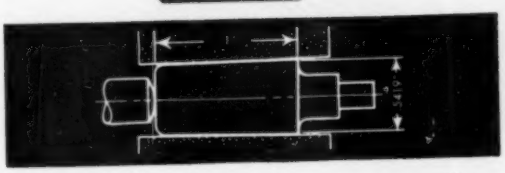
LANDIS *Machine* CO.

WAYNESBORO •• PENNSYLVANIA

New! timed cycle loader

600 PER HOUR TAPERED ROLLER
5 micro inch finish
.001" stock removal
.00025" tolerance

here are actual production figures

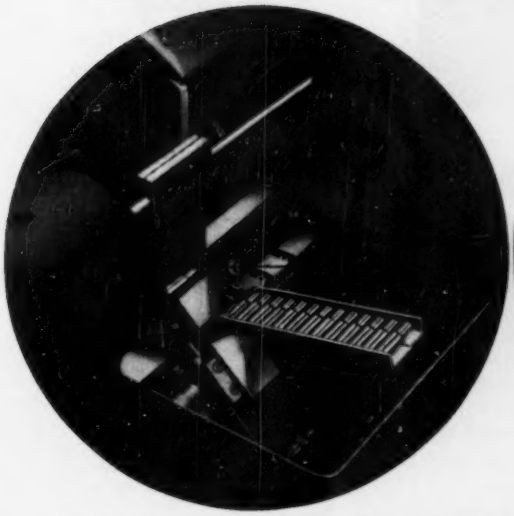


LANDIS TOOL
Precision Grinders

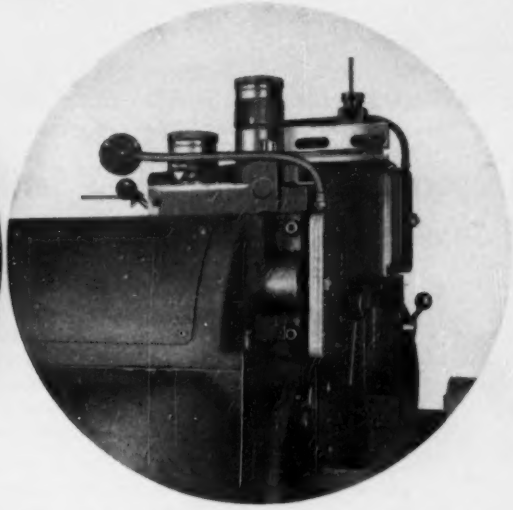
for centerless infeed grinding

now available on LANDIS TOOL centerless grinders

● **loader moves work between the wheels and ejects after grinding.**



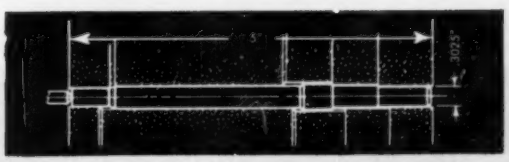
Work loaded from side for infeed grinding of 3 diameters. Both grinding and regulating wheels are profile dressed.



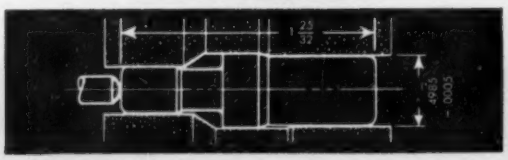
Profile bars on grinding wheel and regulating wheel dressers. Note how the simple design permits quick changeover on new job set-ups.

If you have a precision grinding problem, production estimates and tooling suggestions will be made on the basis of your blueprints.

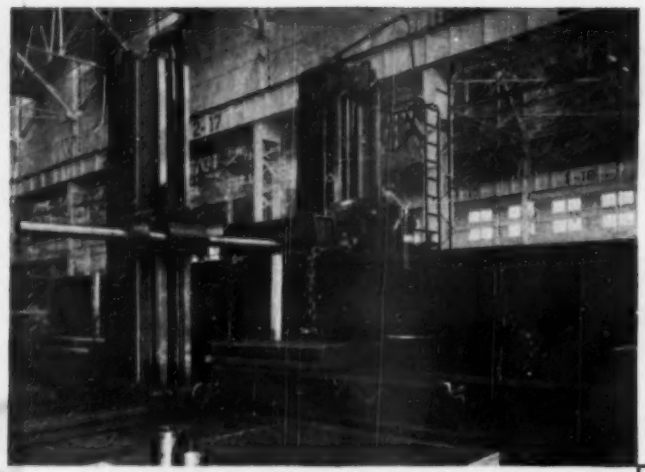
300 PER HOUR SHAFT—4 DIAMETERS, 1 TAPER
.0005" limits on diameter
.012" stock removal



370 PER HOUR 3 DIAMETERS
.008" stock removal
.0005" tolerance



LANDIS TOOL COMPANY / WAYNESBORO, PENNA., U. S. A.



(Above) *Boring 10¼" Dia. Hole in Gear Case of Boom*

How To Machine Large Parts . . . *in fewer settings!*

10 Operations Completed in 3 Settings of Shovel Boom . . . Wgt. 32,000 Lbs.

(Above) *32,000-lb. Welded Steel Boom*

Manufacturers of heavy cumbersome equipment can use the versatility of G & L machines to good advantage. The variety of available operations such as boring, drilling, milling, facing *and tapping* often makes it possible to perform numerous operations in one setting. Lost time in moving the part to other machines and resultant inaccuracies are eliminated.

In this installation a 48-ft. long welded steel shovel boom is machined completely in only three settings. Ten operations, including milling, boring, facing and drilling, are performed.

Since the machine table is 25 feet shorter than the shovel boom, great care is exercised in setting it up for machining. All strains of overhang are shimmed out, while ends are supported by jacks. The job is then bolted to the machine table and jacks removed.

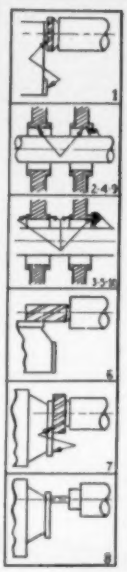
G & L machines are being used for unlimited machining operations on both small and large parts in many industries. With G & L attachments and accessories there is practically no combination of operations that cannot be performed with great speed and economy. Feeds and speed ranges cover all metals, and practically any cutting requirements.

G & L engineers will be glad to make recommendations for faster machining of your work on present or new G & L equipment. They are at your service without obligation.

Versatility:

FOR PROPER MACHINING SEQUENCE AND FEWER SETTINGS

Proper machining sequence is available through ample feeds and speeds and versatility of G & L machines. The ten operations on the shovel boom are shown below:



FIRST SETTING:

OPERATION 1—Mill eight pads for set-up purposes on Operation No. 7.

OPERATION 2—Bore two 10⅛" diameter bores in gear case. (3 cuts, rough, semi, and finish.)

OPERATION 3—Face and back face both sides of bores.

OPERATION 4—Bore two 8.377" holes for intermediate gear shaft.

OPERATION 5—Face and back face both sides of bores.

OPERATION 6—Mill strip on top face of gear case for alignment purposes in Operation No. 7.

SECOND SETTING:

BOOM ROLLED OVER 90° AND PARALLELS PLACED UNDER PADS MILLED IN FIRST OPERATION

OPERATION 7—Mill top of gear case.

OPERATION 8—Drill twenty-two 1¼" holes in gear case cover flange.

THIRD SETTING:

BOOM TURNED AT ANGLE OF 39° 14' 17" TO CENTER LINE OF SPINDLE

OPERATION 9—Bore two 5½" holes for worm drive.

OPERATION 10—Face and back face both sides of bores.

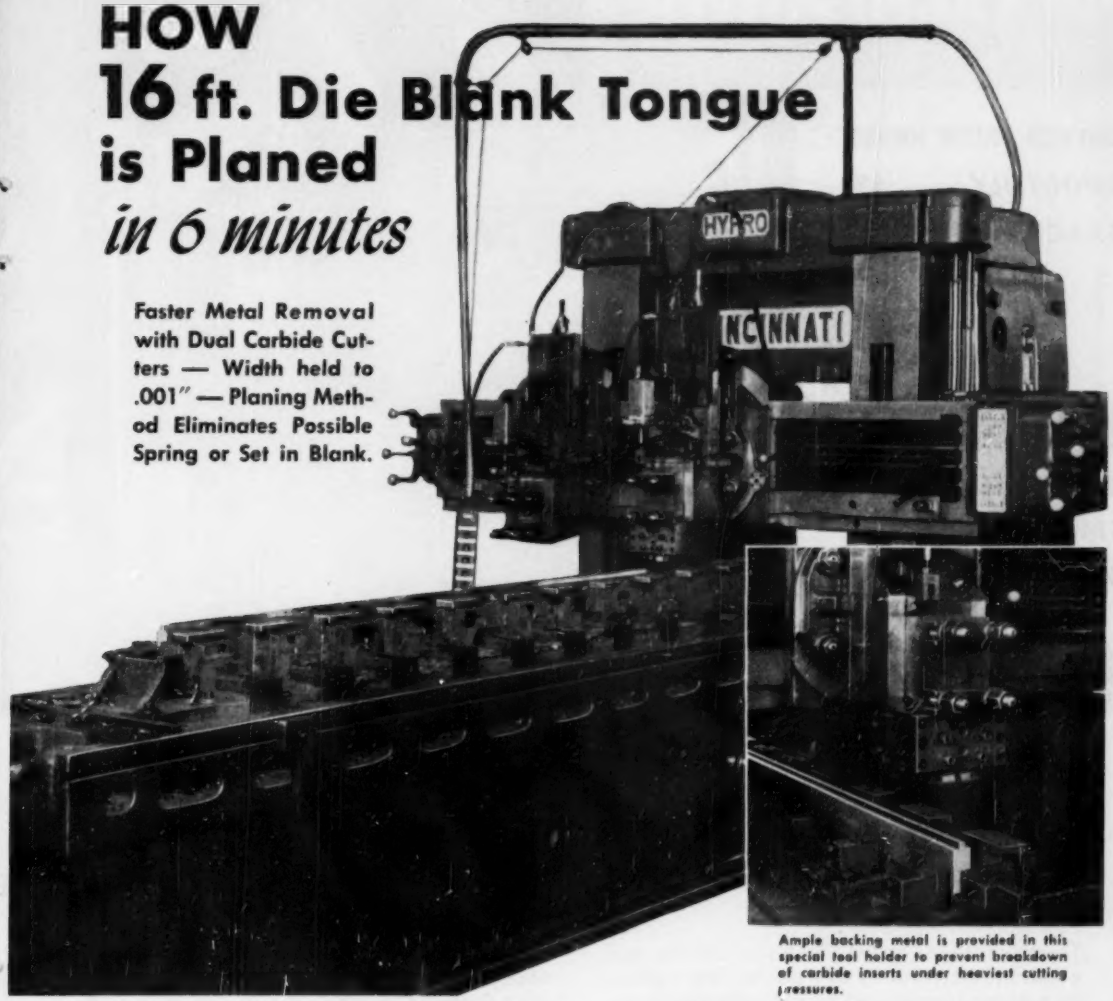
Other unusual jobs are described in the Giddings & Lewis handbook "Horizontal Boring, Drilling and Milling Machines and Their Application." This book contains 266 pages of valuable information. Cost: $5.00.

GIDDINGS & LEWIS MACHINE TOOL COMPANY

FOND DU LAC, WISCONSIN, U. S. A.

HOW 16 ft. Die Blank Tongue is Planed *in 6 minutes*

Faster Metal Removal with Dual Carbide Cutters — Width held to .001″ — Planing Method Eliminates Possible Spring or Set in Blank.



Ample backing metal is provided in this special tool holder to prevent breakdown of carbide inserts under heaviest cutting pressures.

Removal of metal to form a tongue in this high carbon steel press brake is quickly accomplished with a standard Cincinnati Hypro Planer. With this machine, equipped with carbide cutters mounted in a special tool holder, .008″ feed at 250 feet per minute is used. Overall time to cut metal to ⅜″ depth is six minutes. This includes finish planing the top and sides opposite the tongue base.

A holding fixture, mounted on the machine table, speeds work settings. The die blank is quickly placed between block-type holding jacks and rapidly clamped with an air wrench. The rigid way in which the workpiece is held combined with the smooth, powerful operation of the planer makes it practical and profitable to use carbide cutters for this machining operation. Cutting tools are firmly held in a special heavy-duty type holder mounted on the clapper box. Advance design of the cutters and holder simplifies tool change-over for various planing operations.

After the tongue is completed, the die blank is turned over in the fixture and sides are straddle planed to size and finish. Additional planing operations to obtain any die contour, shape, or form follows in easy sequence.

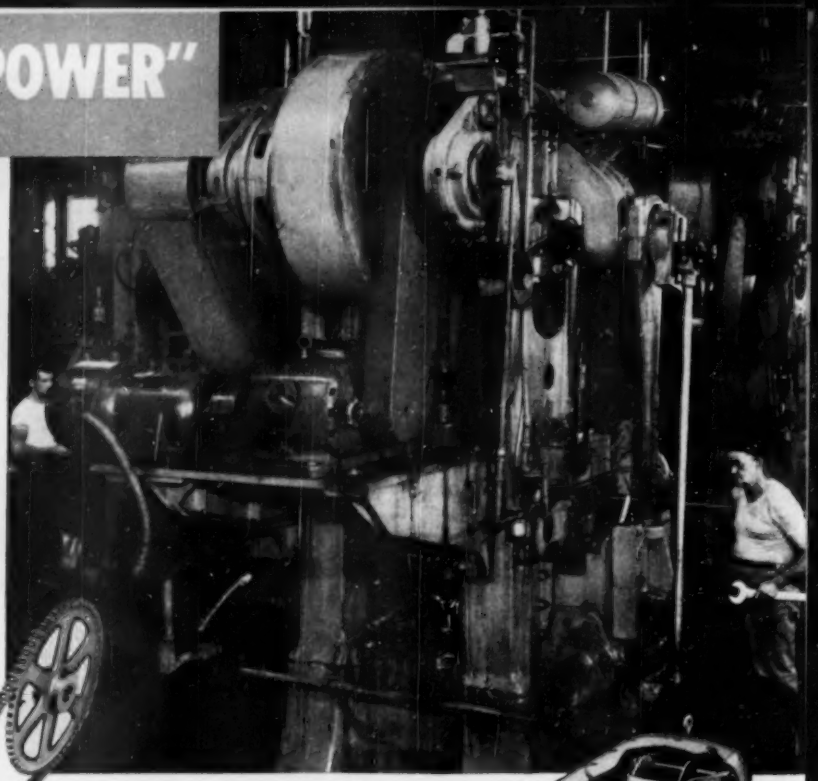
If your manufacturing processes require machining operations on long, flat, or relatively shallow pieces, planing may provide a faster, more profitable means of removing metal. Without obligation, ask experienced Cincinnati Planer Co. engineers for recommendations.

THE CINCINNATI PLANER COMPANY
(SUBSIDIARY OF GIDDINGS AND LEWIS MACHINE TOOL COMPANY)
CINCINNATI 9, OHIO, U. S. A.

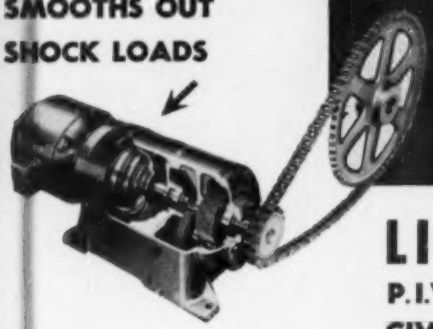
HYPRO

"PACKAGED POWER"

DRIVES HUGE PRESS
SMOOTHLY - - - AT
EXACT SPEED



LINK-BELT
ELECTROFLUID DRIVE
SMOOTHS OUT
SHOCK LOADS



LINK-BELT
P.I.V. VARIABLE SPEED DRIVE
GIVES PRECISE SPEED

The advantages of the Electrofluid Drive are available on virtually any power application through combination with other Link-Belt enclosed gear and chain drives. Above is shown one such combination affording shock-proof, economical power transmission at precisely controlled speed.

Three principal advantages of this drive are:

(a) **It provides smooth power transmission, assuming the load gradually, and eliminating shocks.**

(b) **It prevents damage to costly power-driven equipment and eliminates work stoppages.**

(c) **It permits the use of a smaller motor than ordinarily required to handle starting loads, improves power factor and overall efficiency.**

TYPES OF LINK-BELT POWER TRANSMISSION MACHINERY

Precision Steel Roller Chain	P.I.V. Variable Speed Drives
Silverstreak Silent Chain	Fluid Drives
Steel and Malleable Chain	V-Belt Drives
Worm Gear Drives	Ball Bearings
Herringbone Gear Drives	Roller Bearings
Helical Gear Drives	Babbitted Bearings
Gearmotors	Couplings, Clutches, Collars, etc.

Coupled with the Link-Belt P.I.V. Variable Speed Drive, this installation permits instantaneous adjustment of output speed within the smallest fraction of a revolution, to meet the exact requirements of the work in hand.

Ask for Book No. 2385 for full details and application suggestions on the Electrofluid Drive.

Book No. 1874-B gives corresponding information on the P.I.V. Variable Speed Drive.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
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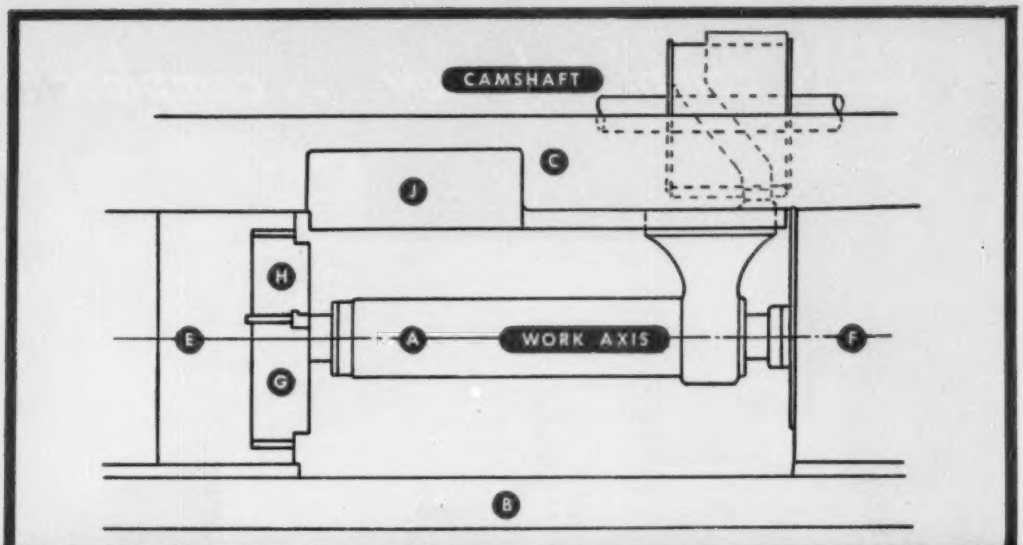
11.670

LINK-BELT

Power Transmission Machinery
"THE COMPLETE LINE"



THE *good* THAT MEN DO

The horizontal design Tooling Area, shown above, is a contribution by Frank L. Cone to the improvement of the Multiple Spindle Automatic Bar Machine that will live long after him. The advantages, stated below, are made possible by the machine's Overhead Camshaft. Specific data invites comparison.

THE TOOLING AREA OF THE CONOMATIC (1½" Six Spindle):

1. **Handles longer work than can be handled by the tooling area of any other "automatic."**

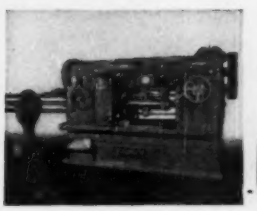
   The length of the Tooling Area is 46 1/16 ins., which permits standard machining operations on work up to 18 ins. in length from the face of the cut-off tool.

2. **Is more strongly supported by the machine frame than is the tooling area of any other "automatic."**

   The stocky Uprights, E and F, which are shorter than those of other "automatics," are securely bolted to — and held between — the Top Bed, C, and Base, B, which are larger and heavier than such members of other "automatics." *The Uprights are 22" high. The Top Bed is 8" high, 23" wide and 103¼" long. It weighs 1232 lbs. The Base is 33⅜" high, 46" wide and 110" long. It weighs 6655 lbs.*

3. **Provides more Tooling positions than does any other "automatic."**

   The Main End Slide, A, has 6 positions. The Main Cross Slides, G and H, front and rear, have 6, and the Auxiliary Cross Slide, J, front and rear, are 2 more, which make a total of 14.



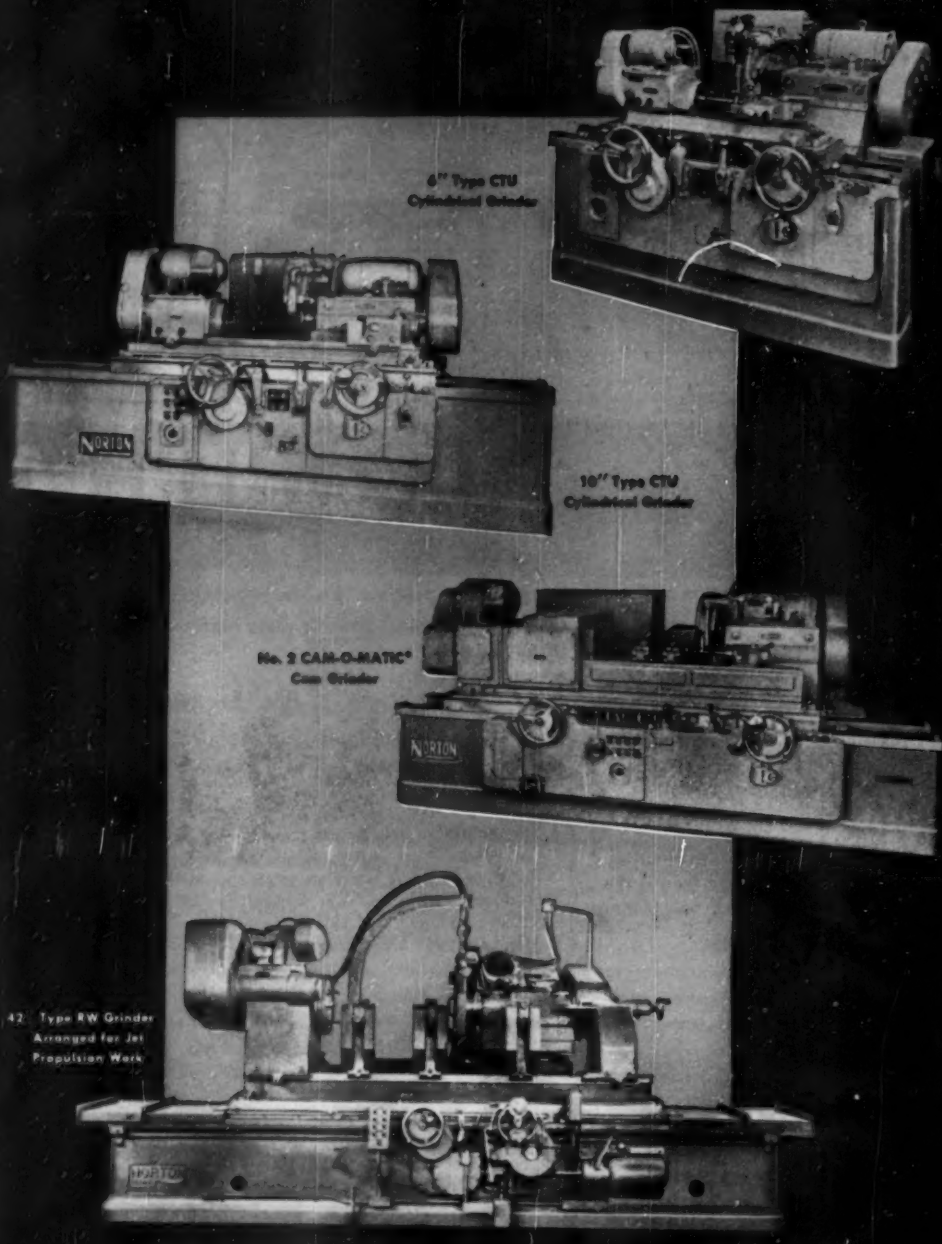
Buyer's Comparison Chart will guide you to full information

A Comparison of ALL Automatics is in Favor of Cone

Conomatic}

CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

TEN *completely new . . . completely*



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different NORTON MACHINES
to meet Today's cost cutting requirements

- These 10 new grinders and lappers are a further Norton contribution to "The World's Best Investment"—machine tools.
- Seldom are *so many* completely new and different machines offered at one time.
- All are expressly designed from up-to-the-minute knowledge of the things that make for *more production, easier operation* and *minimum maintenance.*
- Let a Norton representative show you where any one—or all—of these machines can *help you.*
- Catalogs on request—no obligation.

M-572

No. 16 FC Lapper
SEAL-O-LAP* Lapper
No. 20 Cutter and Tool Grinder
8 x 24" Surface Grinder
10 x 20" Universal Grinder
No. 12 Simplex Surface Finisher
NORTON

*Trademark Reg. U. S. Pat. Off.

NORTON COMPANY, WORCESTER 6, MASS. - New York - Chicago - Detroit - Cleveland - Hartford - Distributors in All Principal Cities

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WHEREVER YOU ARE, there is a nearby Allis-Chalmers Certified Service Shop to keep your motors and other electrical equipment running smoothly. These independent shops are selected after careful investigation for their up-to-date equipment, experienced personnel, good business practices and will to serve. They use only factory-approved parts and methods.

When you need repairs or maintenance on motors and other electrical equipment, depend on Allis-Chalmers Certified Service. Write for a list of the Certified Service Shops near you.

For New Motors and Control . . .

No one knows more about correct motor and starter application than your A-C Certified Service Shop. When you need new motors or starters, check with the one in your area or with your nearest A-C Sales Office.

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CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

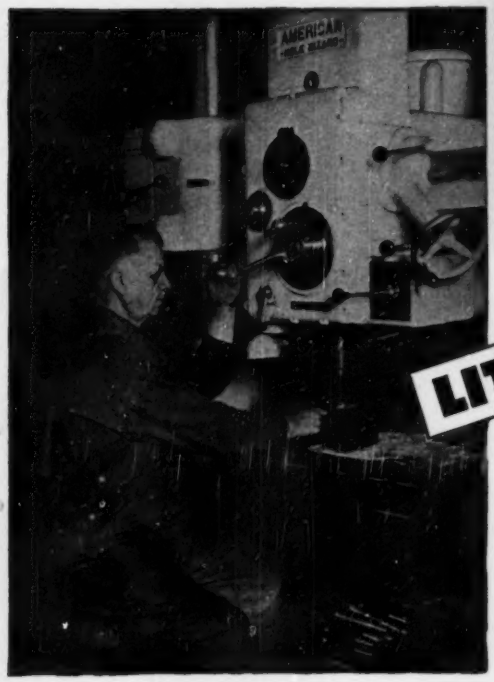
TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

BIG HOLES



LITTLE HOLES

It makes no difference — there's an "AMERICAN" for every job.

"AMERICAN" Hole Wizard Radials are meeting the challenge of intensive production without a whimper. Day in and day out in the production shops throughout the country they are drilling, boring and tapping at top speed and at the same time maintaining amazing standards of accuracy.

Manufacturing shops that have established enviable records for low cost production are using "AMERICAN" Radials.

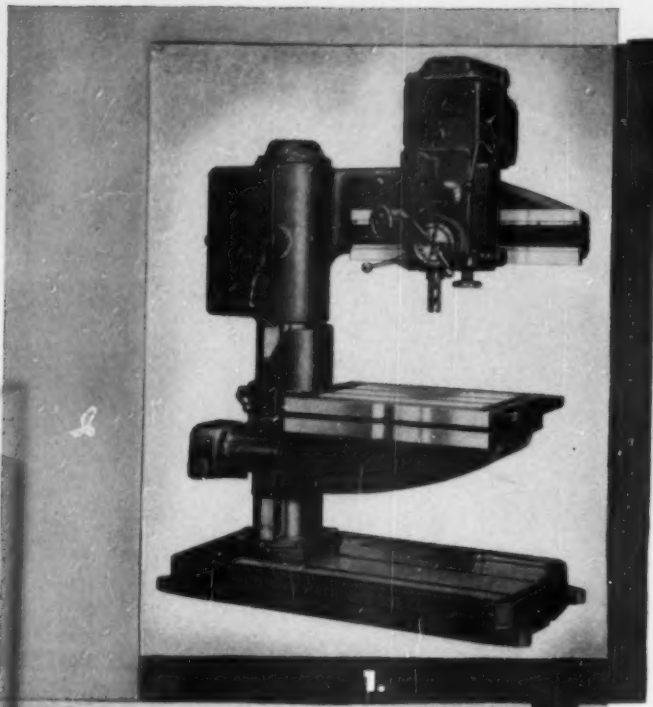
THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

Lathes and Radial Drills

FOSDICK PRECISION

1. The new Fosdick Sensitive Radial built in 3′ and 4′ sizes.
2. Improved Hydraulic Radial built in 11″ to 19″ columns.
3. Fosdick improved Jig Borer. .
4. Fosdick Economax Upright Drill furnished with box and round columns.
5. Fosdick four spindle High Speed Drill.
6. New 21″ B.M. Fosdick Upright Drill.



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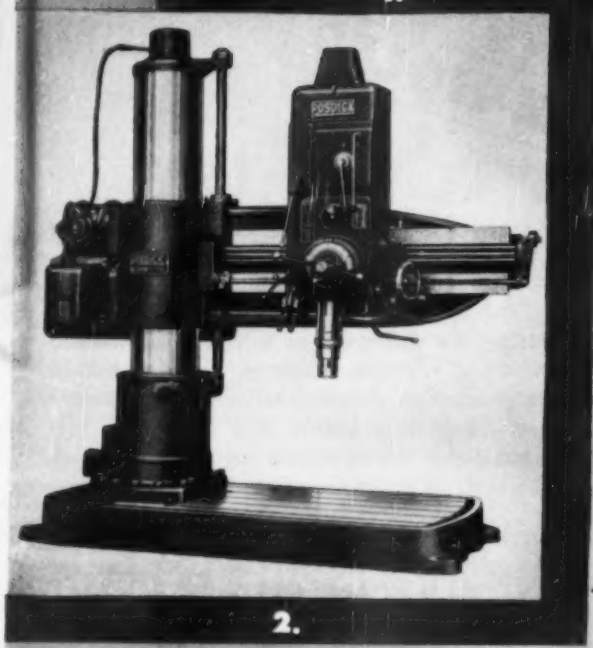


2.

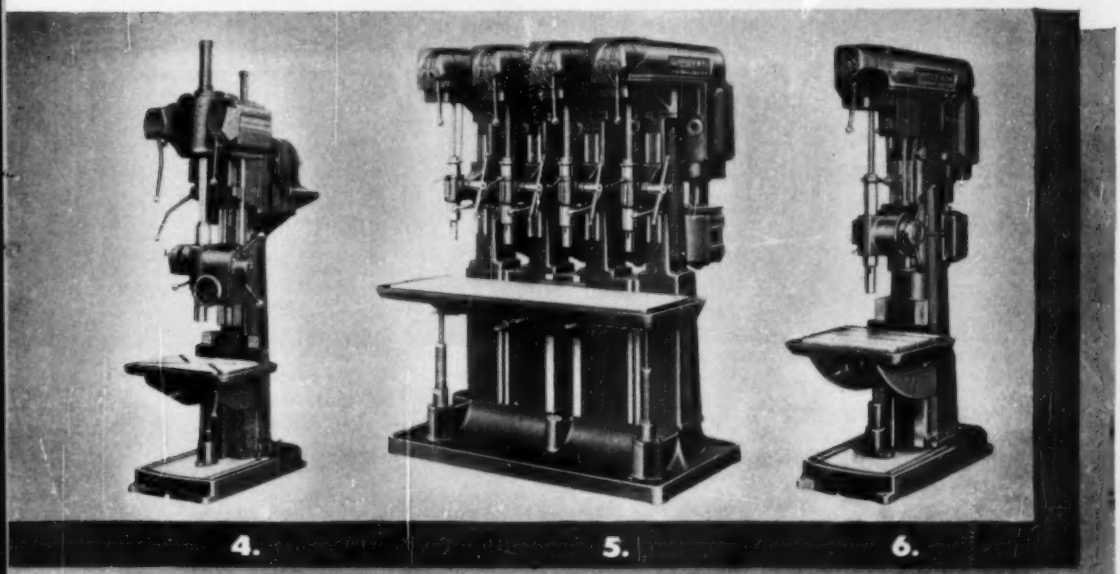
3.

Presents a modern line of *MACHINE TOOLS . . . .*

●Included in this modern line of Fosdick Machine tools are machines for drilling—reaming—boring—facing and similar operations. Fosdick Jig Borers have gained wide acceptance for precision operations, in tool rooms and tool and die shops. Hydraulic Radial Drills are available in types and sizes to meet your most exacting requirements. The new Sensitive Radials, which combine the advantages of both the Sensitive and Radial Drills, provide a high speed sensitive machine for radial work.

Also included in this line are Sensitive Drills in single and multiple spindles up to six. For high production a single purpose Sensitive with one speed and one feed has been added. Standard Sensitive Drills are equipped with six or nine speeds. Medium and heavy duty Upright Drills are obtainable in both box and round column types. Special production features can be added to any one of the Fosdick Machines.

Consult a Fosdick Representative or write for bulletin for detailed information.



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THE *Fosdick* MACHINE TOOL COMPANY
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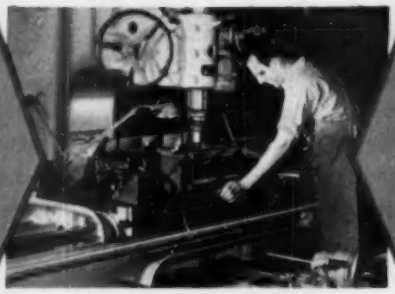
FOR TODAY'S ALL-IMPORTANT NEED:

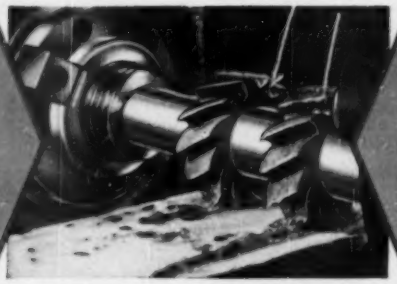
Productivity with Economy

Pratt & Whitney PRECISION MACHINE TOOLS



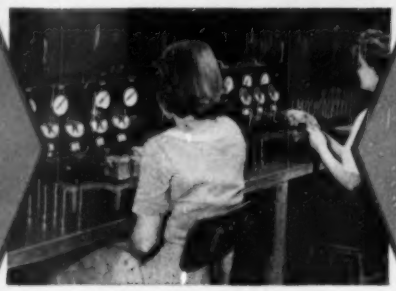
JIG BORERS — JIG GRINDERS — DIE SINKERS — KELLER MACHINES — AUTOMATIC DUPLICATING MACHINES — TOOLROOM LATHES — BENCH LATHES — BENCH MILLERS — AUTOMATIC LATHES — AUTOMATIC CENTERING MACHINES — THREAD MILLERS — VERTICAL MILLERS AND PROFILERS — VERTICAL SHAPERS — VERTICAL SURFACE GRINDERS—GEAR GRINDERS — CUTTER GRINDERS — KELLER-FLEX FLEXIBLE SHAFT MACHINES — DIAFORM WHEEL FORMING ATTACHMENTS

Pratt & Whitney PRECISION CUTTING TOOLS



TAPS — REAMERS — MILLING CUTTERS — END MILLS — CARBIDE CUTTING TOOLS — FORMED CUTTERS — INSERTED BLADE MILLING CUTTERS — DRILLS — DIES — SCREW PLATES — THREADING TOOLS — BLUE HELIX REAMERS — DIE SINKING CUTTERS — DUOCONE DIES — KELLER CUTTERS AND TRACERS — CARBIDE BURS AND DI-BURS

Pratt & Whitney PRECISION GAGING TOOLS



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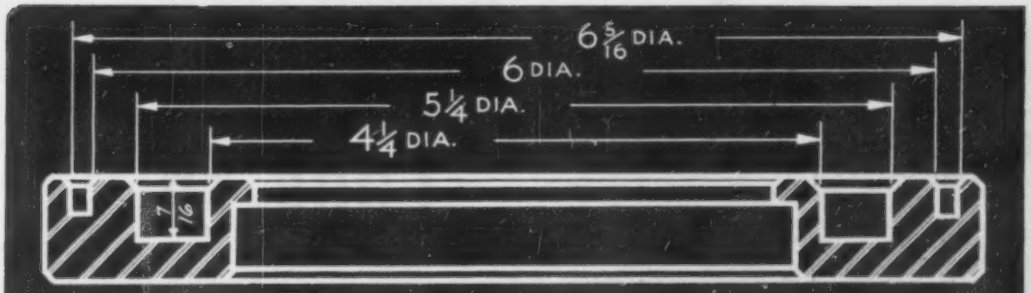
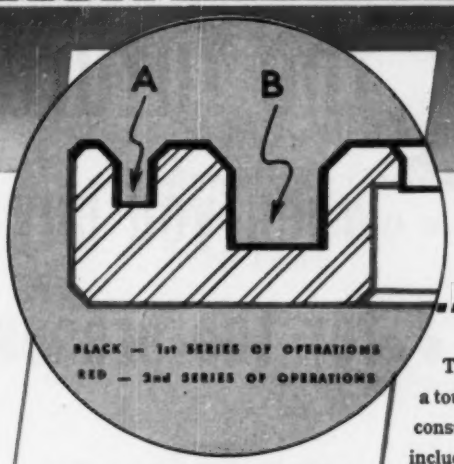
Here are the *right* Tools for competitive 1950. Every Machine, Gage and Cutting Tool listed on this page is designed and built to famed P&W standards of precision, workmanship and performance — to turn out better work, and more of it at lowest cost per unit.

Pratt & Whitney

Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT

"There's no better paying investment than the Right Tools for the Job"





TO MAKE IT PAY ..CONSULT P&J

POTTER & JOHNSTON TOOLING SOLVED THIS "TOUGH ONE"

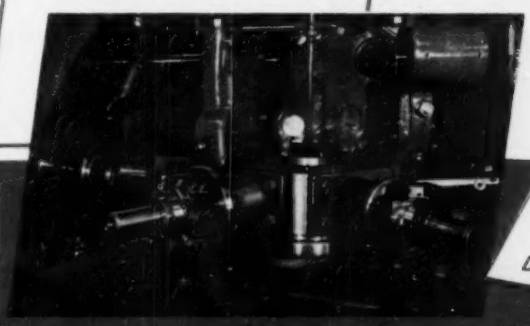
The close-up drawing clearly shows the amount of machining on this forged steel ring — 21 different operations. "A" refers to the trepanning cut from the 6 5/16" dia. to the 6" dia., and "B" points out the second trepanning cut from the 5¼" dia. to the 4¼" dia. Trepanning this amount of steel in one holding indicates how well P&J Tooling teams up with P&J Automatics to combine operations, combine cuts and reduce machining time. Close-up of the P&J-designed trepanning head on the 5D Power-Flex appears below.

The machining on this forged steel Ring job could make it a tough tool-engineering problem: there's considerable, time-consuming work to close tolerances on all faces on both sides, including two trepanning cuts.

Can any of these operations be combined to eliminate unnecessary work handling... can cuts be combined to reduce machine-handling time . . . can machining time be reduced to obtain the greatest possible production?

If the answers are "no", the problem remains a tough one. But the answers are all *"yes"*, because the job is done with P&J Tooling on P&J Automatics — in this case, the 5D Power-Flex.

Practical-minded tool engineers look to P&J Specialized Tool Engineering for the answers to their production problems . . . get their recommendations on *your* tough work.



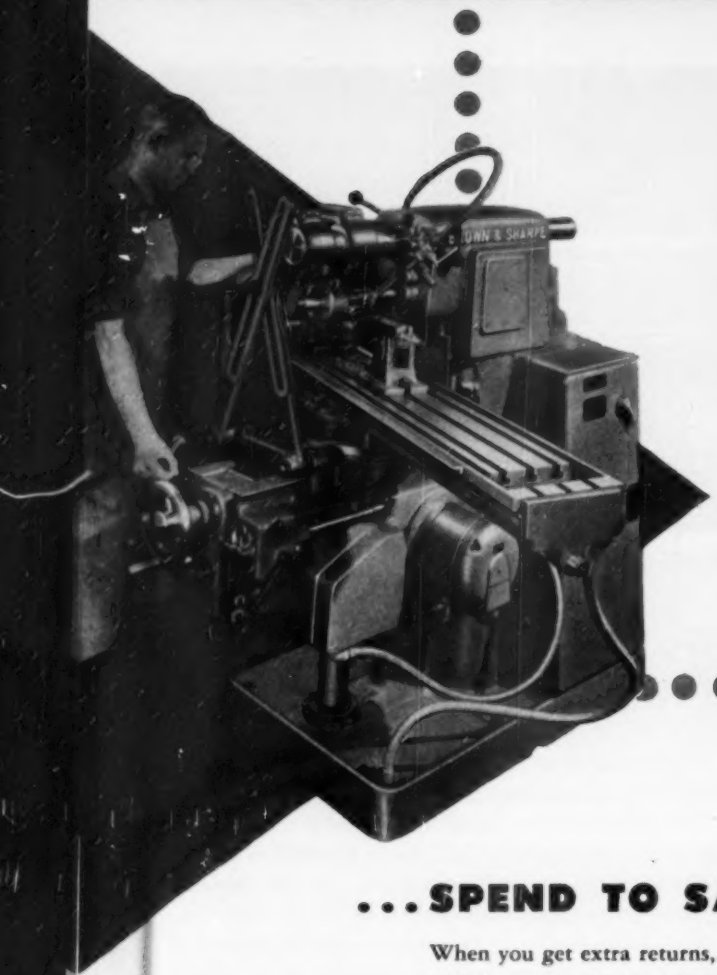
P & J - PRODUCTION TOOLING HEADQUARTERS

Potter & Johnston Company

Pawtucket, R. I.

subsidiary of Pratt & Whitney Division Niles-Bement-Pond Company

P&J



Look to the future when you buy ...for the present...

...SPEND TO SAVE

When you get extra returns, *far into the future,* on your investment in today's machine tools and equipment . . . you *spend* to *save.* You gain not only immediate advantages . . . simplified operation, high accuracy and convenient versatility . . . but also an extremely long productive life. These are the recognized advantages of Brown & Sharpe precision-built machines . . . highly profitable to industry the world over.

Investigate the Brown & Sharpe line before you buy for the present. *Spend to save.* Complete information about any machine sent on request. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

BROWN &

MILLING MACHINES

Universal
Plain (including manufacturing type)
Vertical

GRINDING MACHINES

Universal
Plain
Surface
Cutter and Tool

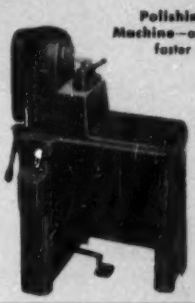
SCREW MACHINES

Automatic (including screw threading, pinion turning and cutting-off types)
Wire Feed

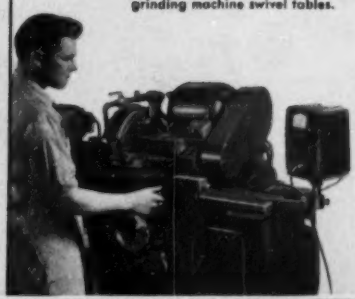
RECENT MACHINE TOOL DEVELOPMENTS

2L and 2LB Surface Grinding Machines—automatically lubricated—for trouble-free, precision surface grinding under extra dusty or severe operating conditions.

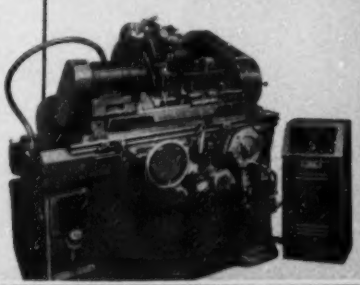
Automatic Cycle and Spark-Timing Arrangement automatically controls spark-out time.



Polishing and Finishing Machine—a complete unit for faster polishing, burring and filing.



Electralign, an exclusive new development, for electronic alignment of grinding machine swivel tables.



Automatic Cycle and Sizing Arrangement automatically sizes from the work.

SHARPE

BS

There's Nothing Else Like It: USERS GAIN IN PRODUCTION

Here's picture-story of how 43% reduction in floor-to-floor time was accomplished on this job. Simple vise type fixture holds 4 workpieces at a time. Operator takes only few minutes to set up for *Mono-Lever* controlled automatic cycle . . . for rapid traverse to point of cut, feed through cut, rapid traverse reverse to starting point and stop for reload. Note that the operator engages *Mono-Lever* control *once* — at start of each cutting cycle. No other attention is necessary. While machine is running operator inspects and burrs finished pieces.

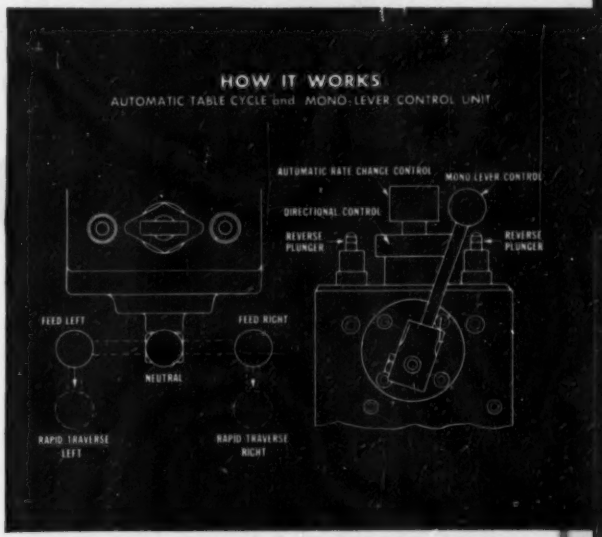
REPORT 16% TO 96% AND LOWERED COSTS

YOU bet there's nothing else like it! We mean the results users are getting with Kearney & Trecker's *new line of* knee-type milling machines with combined *Mono-Lever* control and Automatic Table Cycle. These users are cost-conscious plants. They know what they're talking about when they report increased efficiency — savings of 16 — 31 — 43 — 96% on all kinds of milling work.

Yes, more and more alert, cost-minded production men are buying these new Kearney & Trecker milling machines. Why? Because they've seen the five important profitable things these machines can do: (1) slash idle cutter time; (2) reduce operator fatigue; (3) improve uniformity of finished work; (4) provide greater adaptability in their shop equipment; (5) *return their investment faster.*

Compare these machines with all others on this important five-point basis. You won't be disappointed!

For some startling facts about these new machines as applied to your milling work, consult a Kearney & Trecker Sales Representative, today. Schooled in the "know-how", he's at your service — or write direct: Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.



THINK OF IT! Now you can have all the advantages of this great cost-cutting feature plus the all-around versatility of general purpose, knee-type machines . . . faster, easier control for greater production with less operator fatigue.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

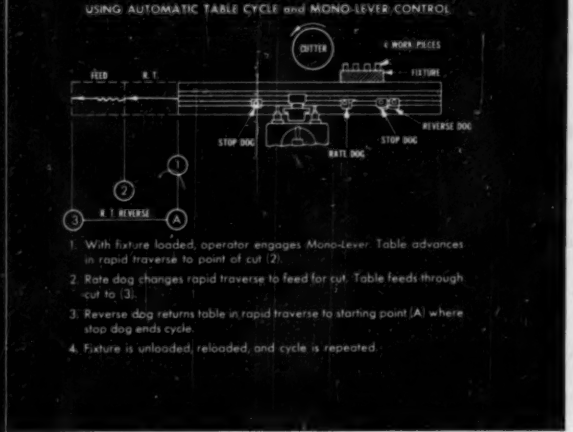
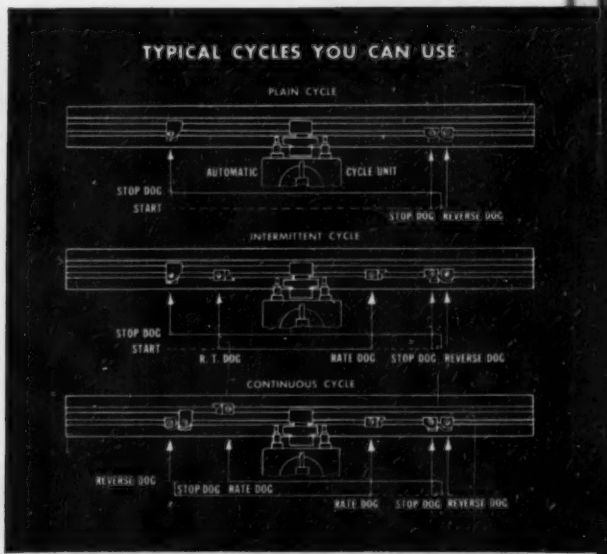

HOW JOB IS DONE
USING AUTOMATIC TABLE CYCLE and MONO-LEVER CONTROL
CUTTER
4 WORK PIECES
FEED
R.T.
FIXTURE
REVERSE DOG
STOP DOG
STOP DOG
RATE DOG
1
2
3
R.T. REVERSE
A
1. With fixture loaded, operator engages Mono-Lever. Table advances in rapid traverse to point of cut (2).
2. Rate dog changes rapid traverse to feed for cut. Table feeds through cut to (3).
3. Reverse dog returns table in rapid traverse to starting point (A) where stop dog ends cycle.
4. Fixture is unloaded, reloaded, and cycle is repeated.

DIAGRAM above shows how machine with new *Mono-Lever* control mills workpieces without operator's constant attention. Note how quickly control engages feed from rapid traverse — eliminating hand "inching" to cut — leaving operator free to inspect and burr workpieces.



THREE DIFFERENT TYPICAL CYCLES to accommodate various job setups. Using the completely automatic cycle feature effects savings of up to 31% for lots of 10 or more pieces. Cycle can be set for loading and unloading time — and can be reversed in feed or rapid traverse.

NEW BLISS STRAIGHT SIDE PRESSES MEET JOINT INDUSTRY CONFERENCE STANDARDS... PLUS MANY ADDED FEATURES

Sturdy box structure is deeper, heavier. Extra long slide adjustment extends versatility. Greater Die life! Close tolerance stampings!

All the advantages of accessibility and adjustment that always distinguish Bliss presses have been engineered into the new lines of Bliss straight side single and double crank presses. And the standard tooling areas and capacities recently set up by the Joint Industry Conference are all built-in too. Tonnage and weight capacities and bed and slide areas are larger in most cases and the length of slide adjustment has been increased up to 100% compared with previous standards.

But Bliss engineers didn't stop there in designing *ruggedness, precision, accessibility* and *versatility* into the new presses. Read about the other new standard construction and operation features (some formerly special) summarized on these pages. They give you good reason to modernize your press room and enjoy the last word in economical operation and superior quality stampings.

Learn the complete story on this new Bliss equipment. Write for catalogs or call for a Bliss representative today.

ASK ABOUT OUR NEW DEFERRED PAYMENT PLAN

1-3 years to pay — 25% down

3¼% average yearly interest on original balance

No finance charges

E. W. BLISS COMPANY, TOLEDO 7, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

WORKS AT: Toledo, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France. SALES OFFICES AT: Detroit, Mich.; New York, Rochester, N. Y.; Cleveland, Toledo, Salem, Ohio; Philadelphia, Pittsburgh, Pa.; Chicago, Ill.; New Haven, Conn.; Windsor, Ont.

BLISS BUILT

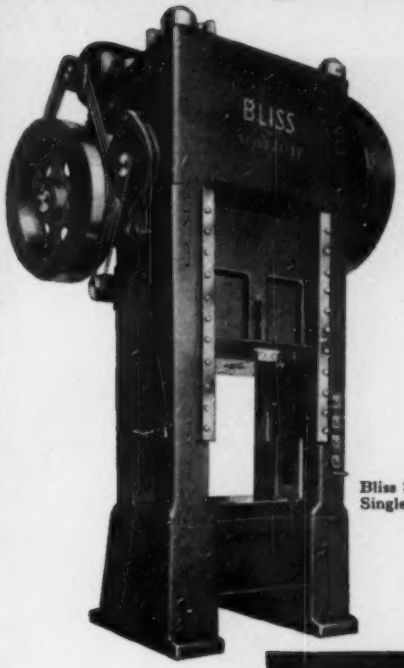
BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD...

All these design features are now standard equipment in Bliss Straight Side Presses

1. **PRESS FRAMES** are of the four-piece tie-rod construction, made of high grade Meehanite castings.*
   a) **CROWNS** are a rigid box structure of deep cross section, heavily reinforced with internal ribs front to back.
   b) **UPRIGHTS** are built to withstand lateral stresses caused by uneven loading of the slide.
   c) **BEDS** are proportioned to handle any distribution of the work load up to the full capacity of the crankshaft. All beds are machined to receive Bliss-Marquette die cushions for forming and drawing work.
   **Presses of steel weldment construction are built in the larger sizes.*
2. **EXTRA LONG SLIDES AND GIBS FOR PRECISION GUIDING OF DIE.** Slide is always in the gibs at any point of the stroke or adjustment.
3. **MOTOR DRIVEN BARREL TYPE SLIDE ADJUSTMENT.** (A former special feature, now standard equipment.) This unit, which has a self-locking worm drive, permits long adjustment and eliminates the need for ring risers and stools when die height varies greatly. Insures accurate alignment and longer die life.
4. **SLIDE IS AIR COUNTERBALANCED,** with cylinders suspended from the top of the crown, permitting easy accessibility.
5. **BLISS ROLLING KEY CLUTCH** is furnished on all geared presses up to 125 tons capacity.
6. **BLISS PNEUMATIC FRICTION CLUTCH** is supplied on all other straight side presses, both non-geared and geared types. Air strainers are used to keep moist air out of the clutch.
7. **SINGLE CRANK PRESSES WITH SINGLE END DRIVE,** from 150 tons to 250 tons capacity, have the Bliss Pneumatic Friction Clutch mounted on the crankshaft. Gears and drive parts rotate continuously. The only load on clutch and brake is that required to start and stop the counterbalanced slide and crankshaft.
8. **PRESS PARTS ARE MADE** on a well developed program of standards with interchangeability among different types and sizes.
9. **CRANKSHAFTS ARE HAMMER FORGED** of 1045 SAE steel. Crankpins are oversize.
10. **STANDARD LUBRICATION** is floor line grease system to the gibbing and main bearings.

Oil tight gear guards, crossbar knockout, outside trimming slide, automatic feeds, die cushions and other auxiliary devices can be furnished for these presses, as well as additional electrically controlled operating or foot button stations suited to your individual production needs.

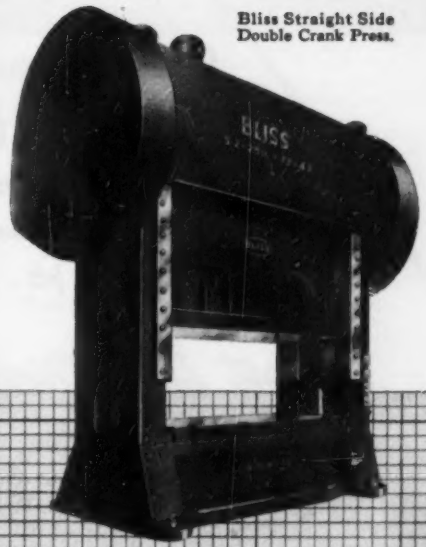
Write for Bulletin No. 17-B for Complete Specifications

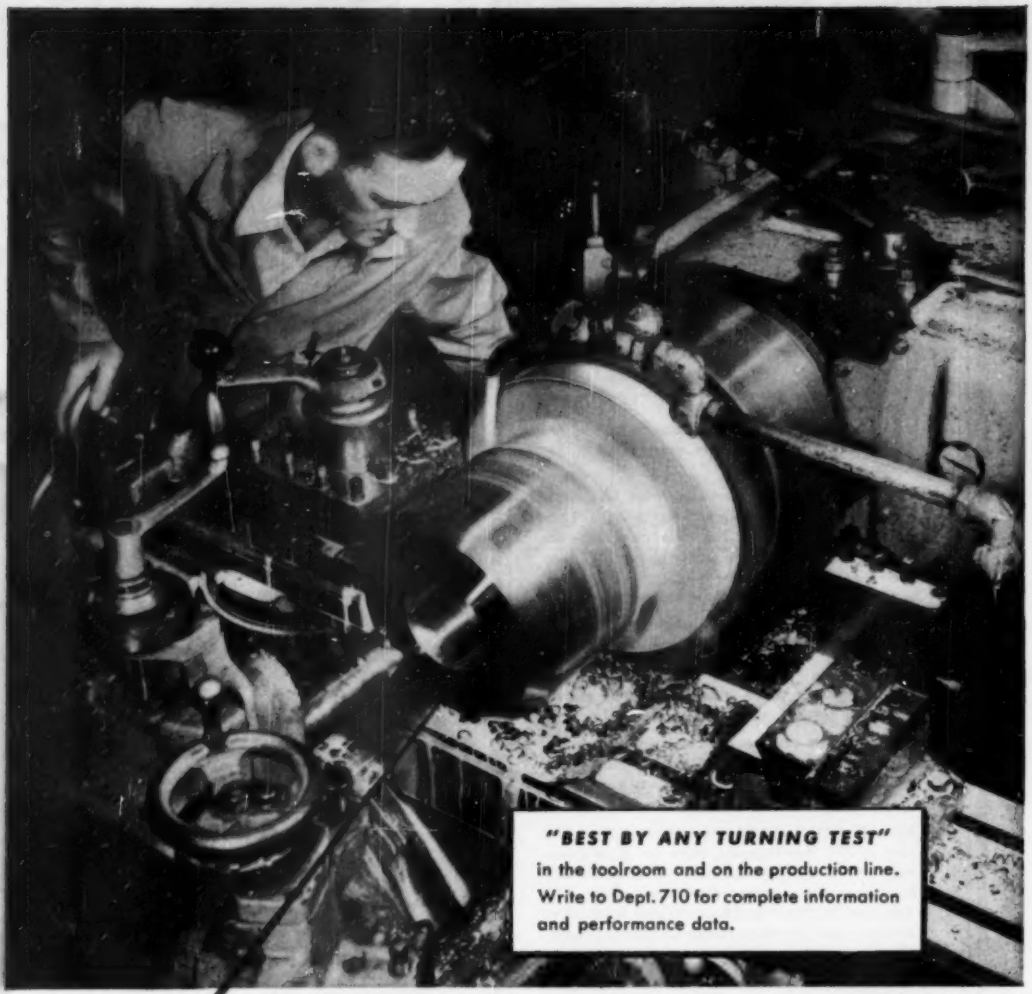


Bliss Straight Side Single Crank Press.

Long adjustment is provided by two barrel type connections.

Bliss Straight Side Double Crank Press.

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Write to Dept. 710 for complete information
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MORE CHIPS per tool
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MORE PROFIT per job . . . than any turret lathe of comparable size!

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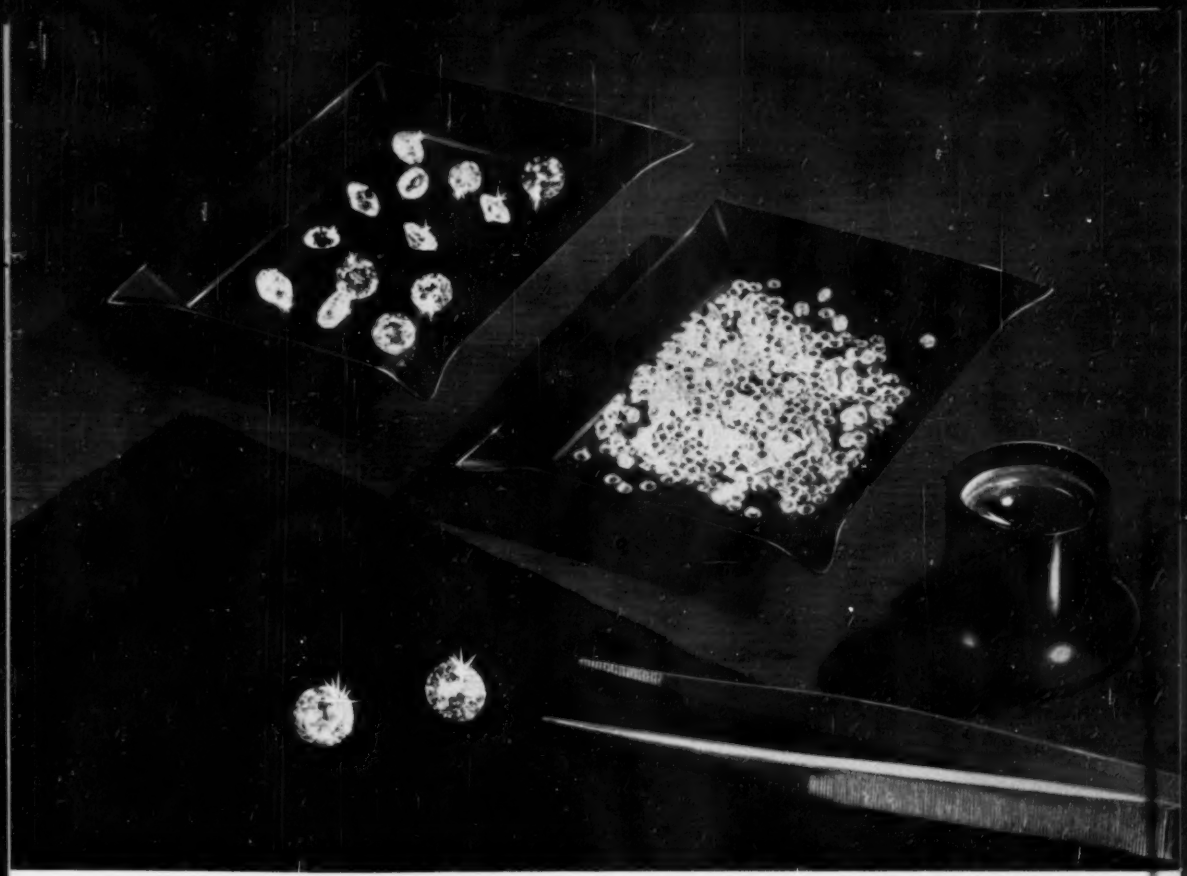

Gems from the collection of Jack M. Wrest

Why did the expert choose these "double diamonds"?

A sparkling pile of precious diamonds—every one of them valuable. But the expert singled out just two—pronounced them perfect—staked a reputation on his decision. His skilled eye detected the flawless transparency, the fiery brilliance that set these two apart from all the rest—the qualities that made them perfect diamonds.

It's very much the same with gears—and of course we're speaking now of "Double Diamond" Gears. Engineers who use gears, and who know gear applications, are quick to identify the basic values that distinguish one gear from another. In the past 35 years hundreds of these experts have selected "Double Diamonds" for as many different power-transmission tasks. Why? Because "Double Diamonds" are generally superior gears to a marked degree—whether judged on the basis of design, strength, uniformity, precision, or performance. With the integrity of their own trademarks at stake, engineers and purchasing agents frequently single out "Double Diamonds" from all the rest, knowing that modern equipment and conscientious craftsmanship can produce nothing finer.

Want more facts about "Double Diamond" Gears? Your inquiry will receive prompt attention—either by mail or by personal visit, as you prefer.

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GEARS

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Automotive Gear Works, Inc.
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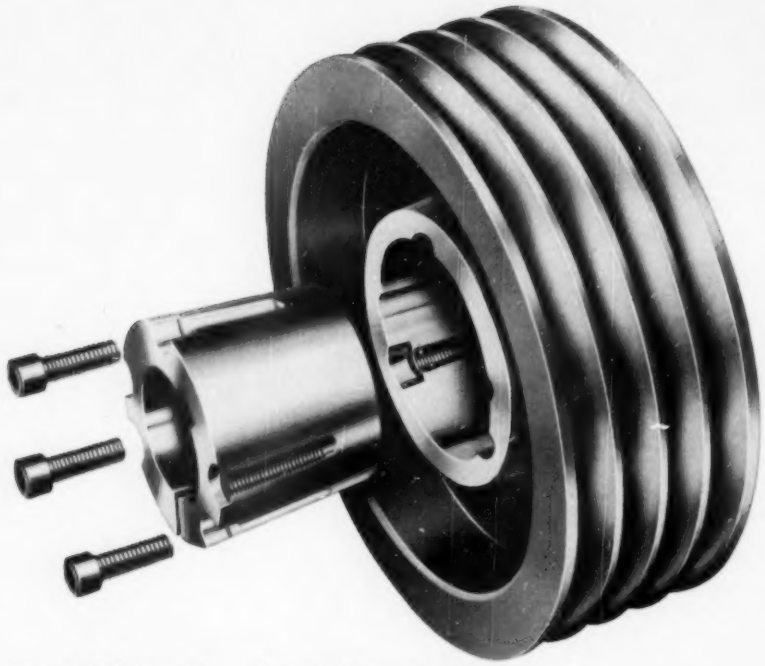
*Reg. U. S. Pat. Off.



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1. No flange. No collar. It's different.
2. Easy on — easy off.
3. Just tighten the screws that wedge the bushing. Simple, isn't it?
4. Always a perfect fit on shaft — tight as "shrunk-on."
5. Complete range of sizes. A, B, C and D grooves, in stock.
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NO OTHER BLADE CHASER

has this two-way adjustment— for both Diameter and Wear

The new Adjustable Blade Chasers, applied to standard Vers-O-Tool heads, are positioned to the specified cutting size by positive, quick diametric adjustment of the head.

New chaser, with block offset to left—cutting edge up to proper working position. At least six regrinds available.

Reground chaser, with block offset to right to compensate for wear—cutting edge still up to proper position.

The double-barrel micrometer gauge, made famous for checking Namco Circular Chasers, is equally applicable for use with the new Adjustable Blade Chasers. It provides accurate determination of the exact amount of metal to be removed in grinding—and a positive check of the reground blades.

The cutting edge is *always* up to the center line—and there's no excuse for inaccurate grinding. The exclusive Namco Double-Barrel Micrometer Gauge takes care of that.

These are two important advantages of the new Namco Adjustable Blade Chasers, designed for use on standard DR, DS and DBS circular chaser heads. But there are other advantages, too.

Adjustable Blade Chasers will provide at least six regrinds—twice as many as conventional blade chasers. And they're so economical, you can use them on short-run jobs, broadening the use of Vers-O-Tool heads to *all* threading work in your shop.

These new Adjustable Blade Chasers, with their holders, are interchangeable with the famous Namco Circular Chasers which are ideal for the longer runs—and they're positioned to the cutting size in the same way, by the quick, positive diametric adjustment of the Vers-O-Tool.

May we show you how they'll increase your threading profits?

Ask for Catalog D-48

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Acme-Gridley 4-6 and 8 Spindle Bar and Chucking Automatics • Single Spindle Automatics • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

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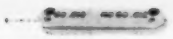
Van Keuren Precision Products

Thread and Gear Measuring Wires

The recognized standard everywhere for measuring screws, gears, worms, hobs, splines, serrations and angles. If you are in doubt about measuring problems send in your blueprints for recommendations.

Wire Type Plug Gages



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Handle .001" to .020" range

Safety Bushing
.020" to .500" range

Giant's Grip Handle
½" to 1" range

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made in

ALLOY STEEL
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THE Van Keuren COMPANY,

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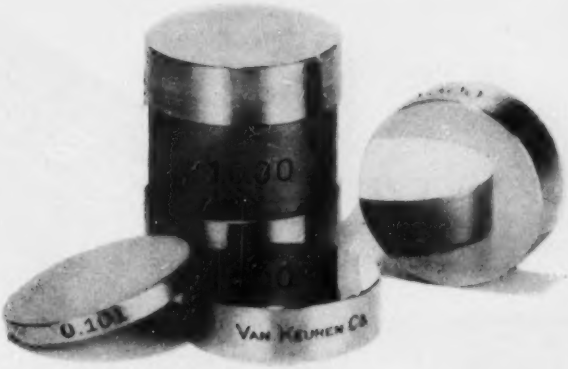
The New Microgages

60% MORE WEARING SURFACE
25% MORE ACCURACY

NO INCREASE IN PRICE



Set M21 $60

1, 2, 3, 4, 5 and 6"

For Setting Large Micrometers

Fused Quartz Optical Flats of Supreme Accuracy

CATALOG AND HANDBOOK NO. 34

This 208 page volume represents 2 years of research sponsored by the Van Keuren Co.

It presents for the first time in history a simple and exact method of measuring screws and worms with wires.

It tells how to measure gears, splines, and involute serrations. It is an accepted reference book for measuring problems and methods.

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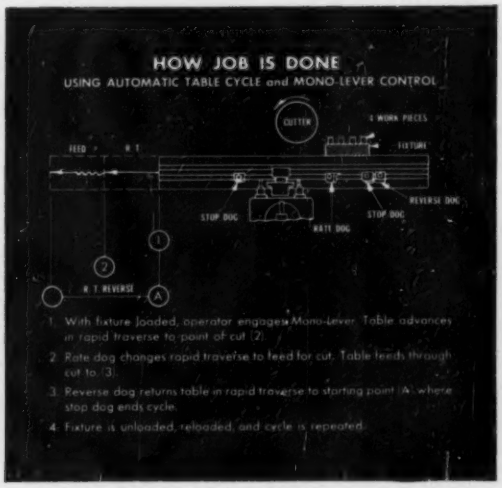
Looking for savings?

PRODUCTION JUMPS 43% HANDLING THESE SMALL PARTS

Here's a picture of savings in the making. Operator sets up machine for automatic cycle operation and engages the Mono-Lever Control just once for each cutting cycle. Result: a 43% production gain on this small parts milling job.


HOW JOB IS DONE
USING AUTOMATIC TABLE CYCLE and MONO-LEVER CONTROL
CUTTER
4 WORK PIECES
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3. Reverse dog returns table in rapid traverse to starting point (A), where stop dog ends cycle.
4. Fixture is unloaded, reloaded, and cycle is repeated.

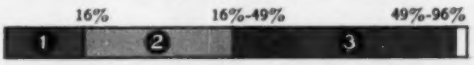
Diagram shows how machine mills four workpieces at a time without constant operator attention. Automatic cycle eliminates need for hand "inching" operation to cut. Operator easily inspects and burrs finished pieces while machine is running.

COMPARE

Production by old method.

Production gain using a Kearney & Trecker Milling Machine with Mono-Lever Control and Automatic Table Cycle.

HERE'S GRAPHIC PROOF OF SAVINGS RESULTS



1. The minimum over-all savings reported from any job when done on a Kearney & Trecker Milling Machine with Mono-Lever Control and Automatic Table Cycle.
2. The *majority* of over-all savings from jobs done on these machines fall here.
3. Under favorable conditions, several jobs done on these machines have shown savings like this!

How are your milling costs? The typical job data given here plus the bar graph, at left, shows you what other users of new Kearney and Trecker Milling Machines with Mono-Lever Control and Automatic Cycle have done to reduce their milling costs. It also shows what these machines can do to reduce yours — from *16%* to *96% on most milling operations!*

Contact us or our nearest representative today. Get proven facts on how Kearney & Trecker Milling Machines with Mono-Lever Control can cut your costs — increase your savings. No obligation. Kearney & Trecker Corporation 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

PRECISION·TAPPING WITH WINTER TAPS

● Precision tapping is accomplished only under certain conditions. These conditions include accurate tapping machines, perfect alignment, positive lead control, and precision made taps.

Winter Balanced Action Taps meet all requirements for precision, including accuracy of flute spacing, thread dimensions, and chamfers. When other operating conditions are correct Winter Balanced Action Taps will produce precision tapped holes.

Winter engineers are available to help you solve your knotty tapping problems.

Winter supplies all common types of taps and dies as well as taps for special applications.

ALWAYS AT YOUR SERVICE

YOUR LOCAL DISTRIBUTOR carries a complete stock of WINTER Taps on his shelves—as close to your tapping problems as the telephone on your desk.

WINTER

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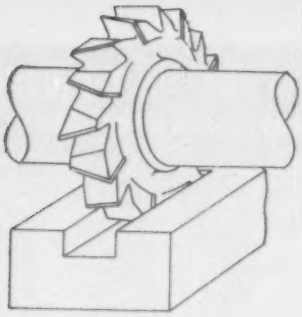


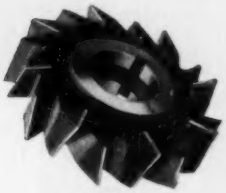
MILLING SLOTS WITH NATIONAL CUTTERS

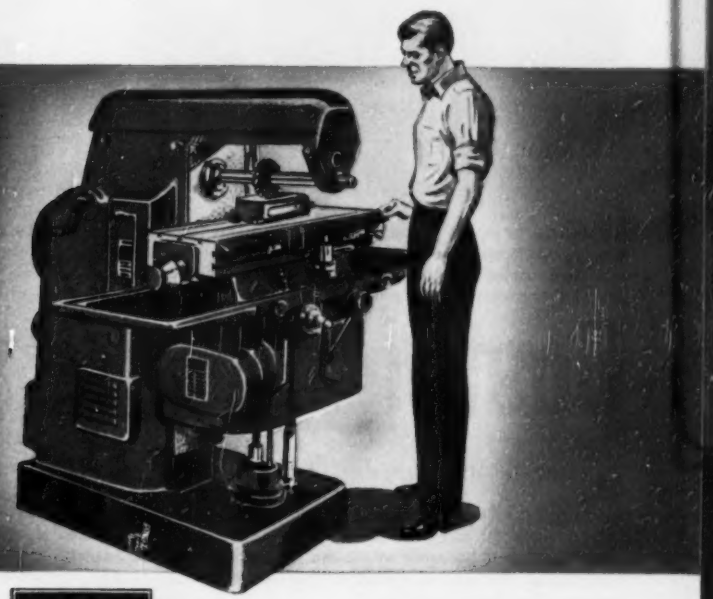
● The important factors in slot milling are: to maintain size or width, to clear out the chips, and to produce the best finish possible.

Several types of National Milling Cutters and Saws are available for this purpose, each designed for a particular application.

National engineers will assist you in selecting the correct type for your job, and will aid by recommending suitable operating conditions.

National products include twist drills, reamers, counterbores, milling cutters, end mills, hobs, and special tools.





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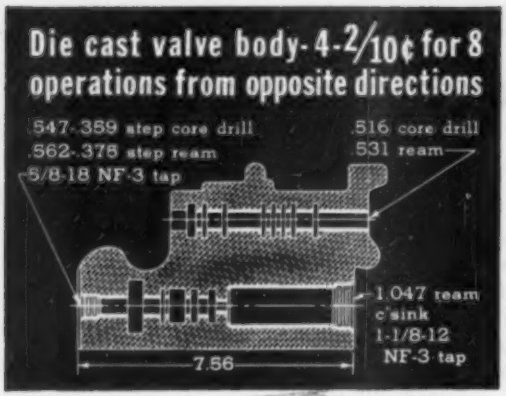
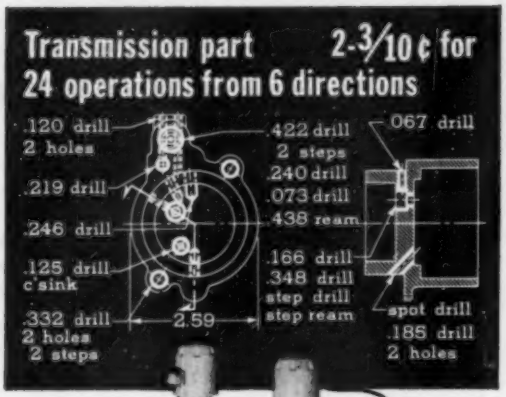
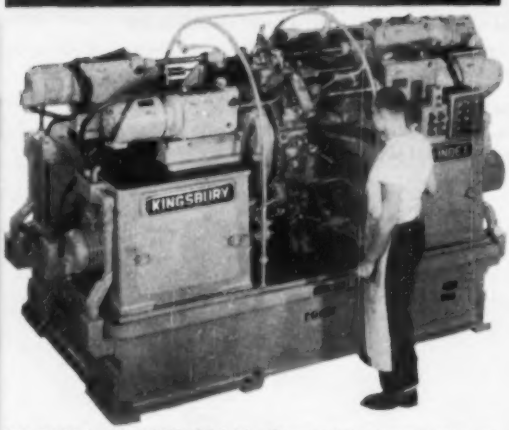
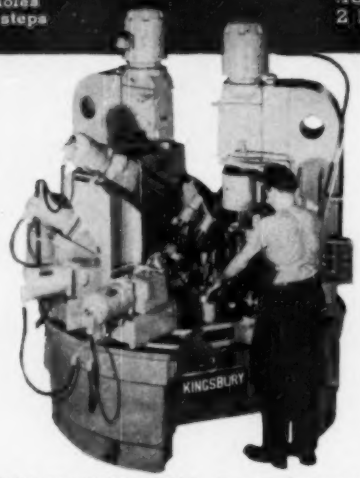






200 PARTS AN HOUR GROSS. Opposed horizontal units on this vertical indexing machine work on opposite faces of the part in the same chucking—three units on the left face and five on the right. Bushings guide all of the tools but the taps.



330 PARTS AN HOUR GROSS. On this horizontal indexing machine ten units work from six directions: vertical, angular, angular across the index table and horizontal—on the radial line and at two angles to it. Bushings guide 15 of the tools.

Costs go down with many

Automatic drilling and tapping machines work from several directions to close tolerances at low cost

Dear Sir:

Look at the number of operations per hour on these parts:

Die cast valve bodies	1280
Transmission parts	6336
Typewriter parts	2688
Throttle bodies	5440

And here are the average costs for man and machine per operation:

Die cast valve bodies	53/100¢
Transmission parts	10/100¢
Typewriter parts	14/100¢
Throttle bodies	19/100¢

We assumed three things: 1) 80% efficiency. 2) Each man's wage rate would equal the national average for such work. 3) The entire cost of each machine and tooling would be paid for after only 6000 hours of operation, a fraction of its useful life. No power or overhead.

You would probably figure these costs another way. But you would get the same result: Kingsburys give low unit costs on high production work.

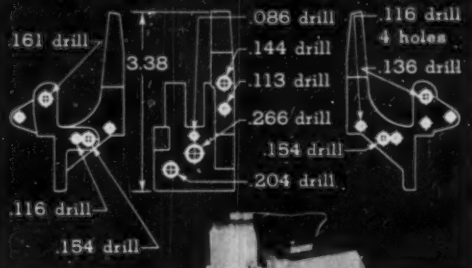
Why unit costs are low

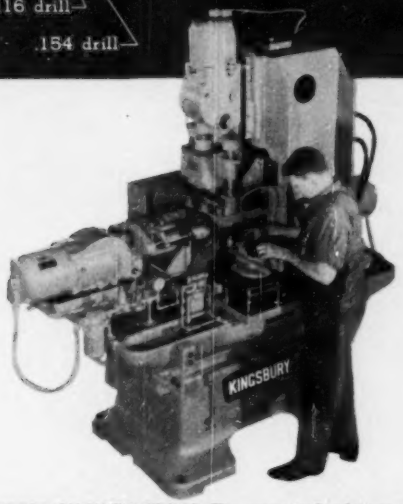
You need several general-purpose machines and several operators to keep up with one Kingsbury and one operator. That costs more, even if your machines would otherwise be idle. You pay for more operators, more supervision, more handling and more space. If your production is high enough to keep a Kingsbury busy most of the time, it would pay for itself in a matter of months.

A visitor argues a point

Somebody once disputed our claim of one person to a machine. He said, "I just saw a line of Kingsburys — big ones with 25 units apiece. All of them needed two chaps. One chap operated it. Another chap had to work full time hauling away chips." We said he exaggerated and stuck to our claim.

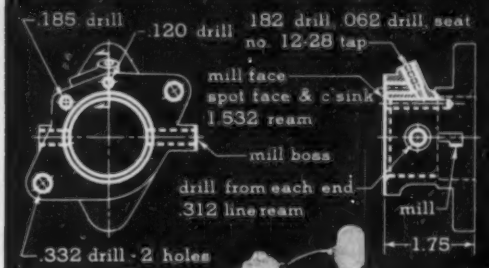
Typewriter part **1-9/10¢ for 14 operations from 3 directions**

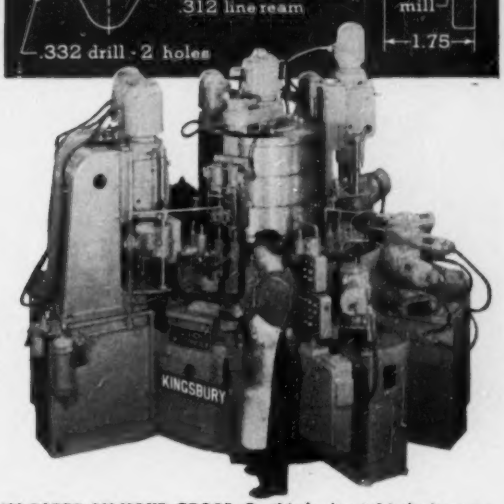




240 PARTS AN HOUR GROSS. The operator loads two parts in the fixture. Three units drill five holes in one part and nine in the other part. The operator indexes the fixture 180° and the units complete both parts. Bushings guide all 14 of the drills.

Throttle body **3-2/10¢ for 17 operations from 5 directions**





400 PARTS AN HOUR GROSS. On this horizontal indexing machine with central column, 13 units work from five directions: vertical, underneath, horizontal, horizontal on the backstroke (milling) and horizontal off radial line. Bushings guide 9 tools.

operations per man-hour

Work from many directions

Each setup above uses a different basic machine. With each type, independent units can operate from different directions in the same chucking of the work. Because we can choose from so many basic machines and units, we can find efficient setups for many jobs.

Close tolerances

Bushings locate tools accurately. Guide bushings are in the fixtures or in plates that pilot to the fixtures. In the four Kingsburys shown, bushings guide 44 of the 63 tools. They do not guide taps, milling cutters or tools that locate from other operations.

Operations are in exact relationship. Each Kingsbury completes many operations in one chucking of the work.

Machining is uniform. Units with automatic cycles and cam feeds perform all operations.

Let's talk about your job

A specific proposal will show you if a Kingsbury can save you money. Just send a print of a high production part to our Mr. L. A. Carll. Tell him the operations and hourly output you need. Or ask him for free bulletins that show 53 setups.

Sincerely,
Kingsbury Machine Tool Corp.
35 Laurel Street, Keene, N. H.

P.S. Don't get the idea we do only *tough* jobs. We can save you money with simple setups too. Just ask us.

KINGSBURY
AUTOMATIC DRILLING & TAPPING MACHINES
for Low-Cost High Production

LODGE & SHIPLEY *COPYMATIC* LATHE

SAVES 50%

production time over former methods at Norris Stamping and Manufacturing Co. Los Angeles, California

DUPLICATE PARTS OR DO REGULAR LATHE WORK

... get instant change over only with the COPYMATIC!

This startling reduction in production time is not just a Lodge & Shipley shop test. It's actually the daily performance record of the Copymatic in the plant of Norris Stamping and Manufacturing Co., Los Angeles, California.

The Copymatic not only cuts time in half for Norris, but this lathe machines their high chrome —high carbon auto rim rolls with unbelievable hardness of Rockwell C 62!

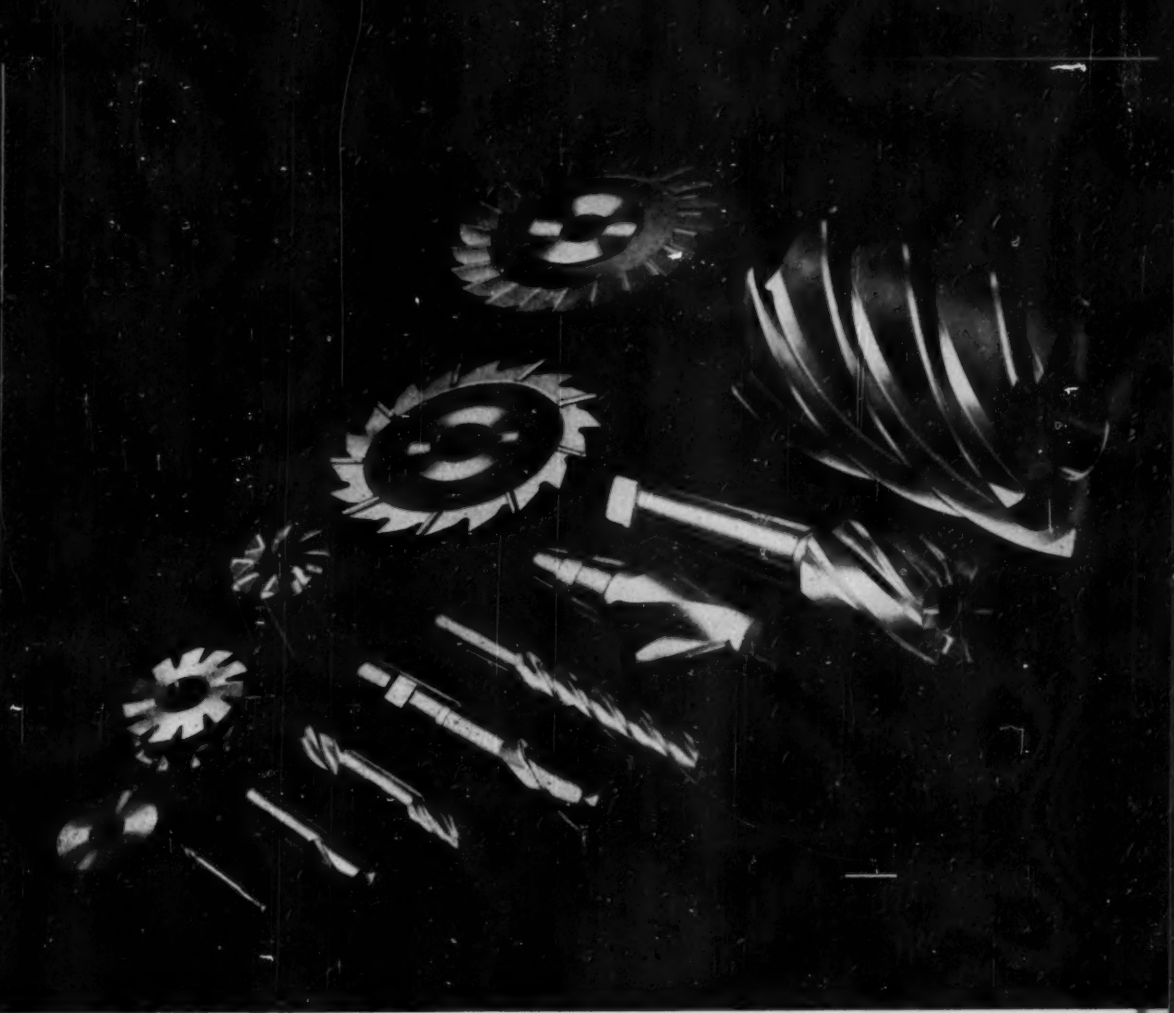
This evidence of increased production and greater power capacity is just part of the Copymatic story. Changeover instantly from automatic tracer controlled duplication to regular lathe work—a feature only the Copymatic offers. No attachments or gadgets to put on or remove.

Using either flat or round templates, the COPYMATIC reproduces square shoulder faces, grinding necks, tapers in both directions, chamfers and curved contours with a high degree of accuracy. Often, the need for a special template is eliminated . . . the first piece of a lot may be produced by standard lathe operation, inserted between the template supports and used to produce the rest of the lot automatically.

The COPYMATIC offers the convenience and speed of hydraulic duplication, with all the versatility of the Lodge & Shipley "Model X" Engine Lathe. This double adaptability of the COPYMATIC takes it out of the special purpose machine class, makes it a profitable producer for any size shop. For additional details write for Bulletin No. 675.

THE **Lodge & Shipley** COMPANY

MACHINE TOOL DIVISION • 3055 COLERAIN
CHOREMASTER DIVISION • 800 EVANS ST.
CINCINNATI 25, OHIO



To help you take full advantage of more efficient machines and new materials, Brown & Sharpe engineers are constantly testing and developing new designs in cutters. In the development of the most practical cutters, diversified manufacturing in Brown & Sharpe's own plant provides an exhaustive testing ground.

Brown & Sharpe cutters have many advanced features of design that permit highly efficient operation. Their dependable performance assures *more* as well as *better* work.

Get fully acquainted with all the advantages of Brown & Sharpe cutters—they cost you less in the long run. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

A COMPLETE LINE OF MILLING CUTTERS

Plain Milling
Helical Plain Milling
Side Milling
Staggered Tooth Side Milling
Inserted Tooth
Angular
Convex and Concave
Screw Slotting
Sprocket Wheel
Gear
End Mills
Metal Slitting Saws

We urge buying through the Distributor

BROWN & SHARPE CUTTERS B·S

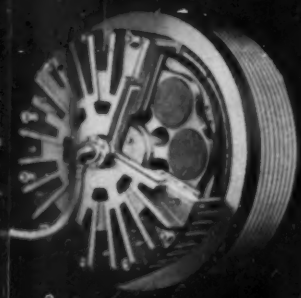
Proving the New Danly Clutch

...in 6 months of continuous 2 shift press operation without adjustment or repair!

This 500 ton press in one of the country's leading automotive plants has run 16 hours a day for over six months... single stroking over 300 times every hour! During this time, the new Danly cool-running clutch hasn't even required adjustment for lining wear! Clutch maintenance, a main item of stamping cost, was virtually eliminated!

A record like this is typical of Danly clutch performance. Danly cool-running clutches are able to outwear conventional clutches consistently because they beat heat, the most destructive element of wear in press clutches.

Less heat is generated when the Danly clutch engages because ingenious design has eliminated a large proportion of the pick-up load involved in starting clutch parts. Forced air cooling dissipates what little heat there is so that the Danly cool-running clutch, under full load, operates only 35° above room temperature .... just barely warm!



Cut-away view showing special method of lining mounting in the new Danly cool-running clutch. Discs of lining material are retained in a "spider" without riveting.

Close-up of stamping of operation performed showing finished lower radiator grill bar. Two pieces are formed at each stroke.

CHECK THESE
EXCLUSIVE DANLY PRESS FEATURES

- ✔ cool-running clutch
- ✔ extra rigidity
- ✔ complete pressure lubrication
- ✔ special controls—sensitive reaction
- ✔ precision construction

SEND FOR THIS FREE BOOKLET
and see how DANLY PRESSES are certain to set new production records in your plant!

MECHANICAL PRESSES...50 TO 3000 TONS

DANLY

DANLY MACHINE SPECIALTIES, INC.
2100 South 52nd Avenue, Chicago 50, Illinois

DANLY
IT COSTS LESS
TO RUN A
DANLY PRESS

THE CARBOLOY "TRIPLE C" PLAN

a proven plan lower the

It has worked for others . . . it can work for you!

UNDER today's conditions of high costs, management's Number One question is, "What can we do to lower our Break-Even Point?"

Many alert manufacturers have discovered one answer to be in Carboloy Company's amazing "Triple C" Plan of Coordinated Carbide Control. Without exception, users have found it a *quick* and *positive* means for realizing important savings in variable costs without major capital expenditures.

"Triple C" is a plan specially developed for this carbide era. Today almost every manufacturer performing machining operations is a user of carbides. Used with maximum efficiency, they can help produce major economies.

Carboloy's "Triple C" Plan permits such economies

The "Triple C" Plan allows manufacturers to get the *greatest benefits* from cemented carbides used in their plants. It produces results that go far beyond mere savings in tool costs.

And just what is "Triple C"? Briefly defined, it is a planned program for coordinating all phases of carbide tool design, application and maintenance *for all types of tools and cutter, both single and multiple point,* in your plant through a system of centralized control. It is the *hub* around which all carbide activities in your plant revolve.

How "Triple C" fits into your picture

This plan can produce sensational results for you, just as it has for the managements of other important companies. It can help lower your Break-Even Point by *reducing costs, increasing production, eliminating waste.* But to accomplish such wonders it must have the wholehearted support of management. MANAGEMENT MUST INITIATE THE ACTION, SUPPORT THE PLAN AND GIVE IT PROPER FOLLOW-THROUGH.

Here's the greatest "package" of important management aids and services ever offered the metal-working industry — designed to help you install and operate the CCC Plan with your own personnel — and available without expense to you!

Carboloy offers you assistance in every way possible to make your "Triple C" Plan a success. Here are 9 important aids available to help you with the installation and operation of your program.

Write today for this CCC Plan Book

You will find it one of the most important and informative pieces of reading matter you have come across in a long time. It tells you in straight-from-the-shoulder fashion the advantages of the "Triple C" Plan and what it can do for you. Fill out and send in coupon on opposite page. Carboloy Company, Inc., 11149 E. 8 Mile Blvd., Detroit 32, Michigan.

CARBOLOY®

for helping management BREAK-EVEN POINT

Complete Carbide Coordinator's Operating Manual—covering all phases of your "Triple C" Plan

Here's the most important tool in the package! This Coordinating Manual contains material gathered from actual practice in many plants on the entire 8 phases of the CCC Plan, as well as valuable case histories on successful, long-time users, suggested forms and records, tips on reports to submit to management and procedure for making surveys. Some of the sections included in this Operating Manual are: Starting and Maintaining the Program, Methods and Planning, Establishing Tool Standards, Records and Reports. You get *all* the information you *need* to make "Triple C" work efficiently and with a minimum of effort. For your directly concerned personnel, Carboloy will provide separate individual sections of this Operating Manual.

Complete Key-Personnel Training Course

Specialized training, *free of charge*, for all your key personnel in all phases of carbide use at the Carboloy Customer Training School in Detroit; *plus* help in establishing your own in-plant training program. Your individual plant problems are covered in this training.

200-page Technical Handbook

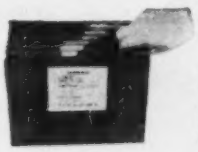
A comprehensive, up-to-date manual on carbide tool design, application and maintenance. Presents basic technical information on carbide tool practices in step-by-step technique. Over 800 practical illustrations. Individual sections are available bound separately.

Carboloy Training Films

A complete series of 6 new training films covering all phases of single-point carbide tool design, application and maintenance. These 35-mm silent film strips give a quick grasp of important phases of carbide technique, and are available at print cost.

16-mm sound motion picture available on loan

Dramatic, 24-minute sound motion picture presents the whole story of the origin, manufacturing process and range of uses of Carboloy Cemented Carbide. Not a training film, but highly educational. Other films also available.



Coordinator's Kit, for your Carbide Coordinator

Gives you all these Carboloy service aids under one cover in a sturdy portfolio. Divided and labeled for handling each separate CCC help, it's a convenient and efficient way to centralize your "Triple C" information.

Carboloy Specialists in principal metal-working areas

Field engineers of wide experience, thoroughly versed in cemented carbide practices, are available for consultation and help on special problems. This service is available to you in all important metal-working areas, coast-to-coast.

Operator Reminder Charts and other training helps

Handy, on-the-job guides for machine operators and others using carbide tools. Helpful "do's" and "don'ts" to aid your operators in getting the maximum efficiency and speed from carbide tools.

MANAGEMENT and SUPERVISORY EXECUTIVES:

Send coupon for Plan Book today!

CARBOLOY COMPANY, INC.,
11149 E. 8 Mile Blvd., Detroit 32, Michigan

Dear Sirs:

We want to know more about the Carboloy "Triple C" Plan to help lower our Break-Even Point. Without obligation, send us a copy of your CCC Plan Book for management and supervisory executives, and tell us how we can get the services described above.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

COORDINATED CARBIDE CONTROL

THE CARBOLOY TRIPLE C PLAN

CEMENTED CARBIDES

What every good production man should know about—

Production advantages offered by

Magnesium Sand and Permanent Mold Castings

There are two major reasons why a design engineer specifies magnesium sand or permanent mold castings. The first is to improve the product. By increasing section thickness and the addition of stiffening ribs, it is possible to obtain *magnesium castings with equivalent strength, greater rigidity, and lighter weight* than can be cast with any other metal. The second reason is to utilize the *production advantages offered by magnesium.*

An outstanding characteristic of magnesium castings that makes for faster, more economical production is unexcelled machinability. A given cut can be made on a magnesium casting in approximately 50% less time than required for any other structural casting alloy. The increased machining speeds practical with magnesium castings yield sizeable reductions in production costs, particularly when extensive machining operations are required.

Magnesium is the world's lightest structural metal—a full one-third lighter than any other. This, too, cuts production costs by simplifying handling problems. Many castings that formerly required mechanical handling equipment can be moved by hand when cast in magnesium. Smaller castings are easier to move and position, reducing employee fatigue and boosting his efficiency. And in many instances, magnesium's extra lightness cuts the shipping costs of both the raw castings and the finished product.

Additional information about magnesium sand and permanent mold castings is available without obligation. Call your nearest Dow sales office or write direct.

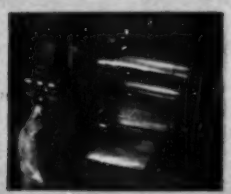
MAGNESIUM CAN ALSO BE ECONOMICALLY FABRICATED INTO

DIE CASTINGS

Magnesium die castings possess all the usual die casting advantages plus greater lightness and excellent mechanical properties. In addition they are surprisingly economical in quantity production.

EXTRUSIONS

Magnesium can be extruded into an almost unlimited variety of shapes and sizes. By tailoring the extrusion to the job, it is often possible to eliminate costly forming and fabricating.



SHEET, STRIP AND PLATE

These forms have the same high strength-weight ratio possessed by other forms of magnesium. For sheet applications requiring rigidity, durability and maximum lightness, investigate magnesium.

MAGNESIUM DIVISION • THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Atlanta • Cleveland • Detroit • Chicago • St. Louis
Houston • San Francisco • Los Angeles • Seattle
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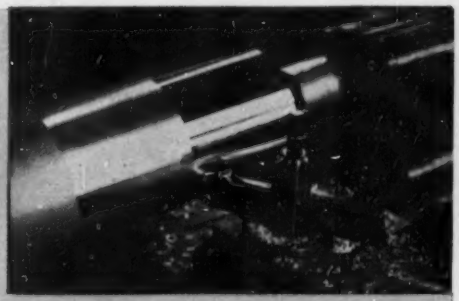
MAGNESIUM

Easiest Structural Metal to Machine



The machinability of magnesium stands head and shoulders above that of all other structural metals. Usually the maximum speeds of machine tools can be used with heavy cuts and high feed rates. That means more pieces per hour—production costs go down. Power requirements for machining magnesium are the lowest of all the structural metals.

Machining operations on magnesium produce an excellent surface finish. In most cases, the finish grinding required by other metals is not necessary for magnesium. Extremely accurate parts with dimensional tolerances of only a few ten-thousandths of an inch can be made by standard machining operations. There is no tendency for the metal to tear or drag. The free cutting action of magnesium normally produces well broken chips which do not obstruct the cutting tools or the machine.

Tool life is good. Carbon steel can be used but high speed steels give better results. Carbide tools give the best results for high production jobs.

Technical handbooks on machining magnesium are available without cost. Write direct to Midland for your copy.

Things to Remember

1. Don't run tools for full life before resharpening. Keep cutting edges sharp and tool faces polished for maximum efficiency. Honing or lapping improves tool life.
2. Tools of the same design used for cutting steel and brass may be used but best results require some modification. Relief angles should be large and tool design must make allowance for the quantity of chips produced.
3. In any machining operation clamp magnesium more frequently but less tightly than steel. This serves to avoid distortion.

JOINING

Established and well defined procedures are used in joining magnesium. All usual methods including riveting, welding and brazing techniques are in common use.

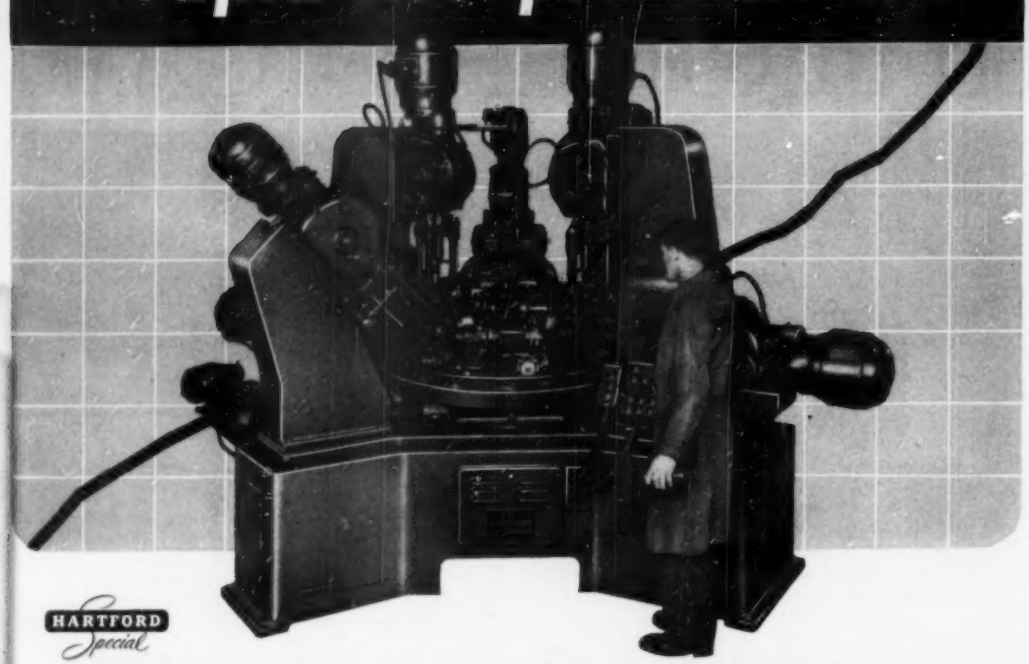
FORMING

The recognized practice of hot forming magnesium permits deep drawn in one operation or intricate repeated annealing and additional draw dies.

FINISHING

There are a wide variety of protective finishes available for magnesium. Magnesium is also adaptable to many decorative and electroplated finishes.

rapid-fire production



HARTFORD Special

AUTOMATIC DRILLING AND TAPPING MACHINES

This machine combines speed and precision. Pieces are held to a close tolerance, yet finished at the rate of 9 seconds each. This six station machine drills and countersinks 4 holes, drills and spotfaces one, and drills and taps 4 holes, using only nine units. Fixtures holding the pieces revolve and are automatically indexed. Electrically interlocked system provides for individual or group operation. Sensitive control arranged with jogging feature allows units to be cycled individually and simplifies setting up and spot checking. Foolproof loading arrangement with automatic knockoff, special chip disposal system, and many other features are incorporated into the design.

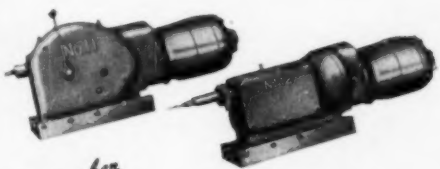
with

"Packaged Engineering"

If you're looking for economy and production in a single purpose machine, investigate the advantages of "Packaged Engineering" that make Hartford Special Drilling and Tapping Machines your best buy in the long run. Write our Engineering department now. The Hartford Special Machinery Company, Hartford 5, Connecticut.

HARTFORD Special

...the standard for special machinery



Remember

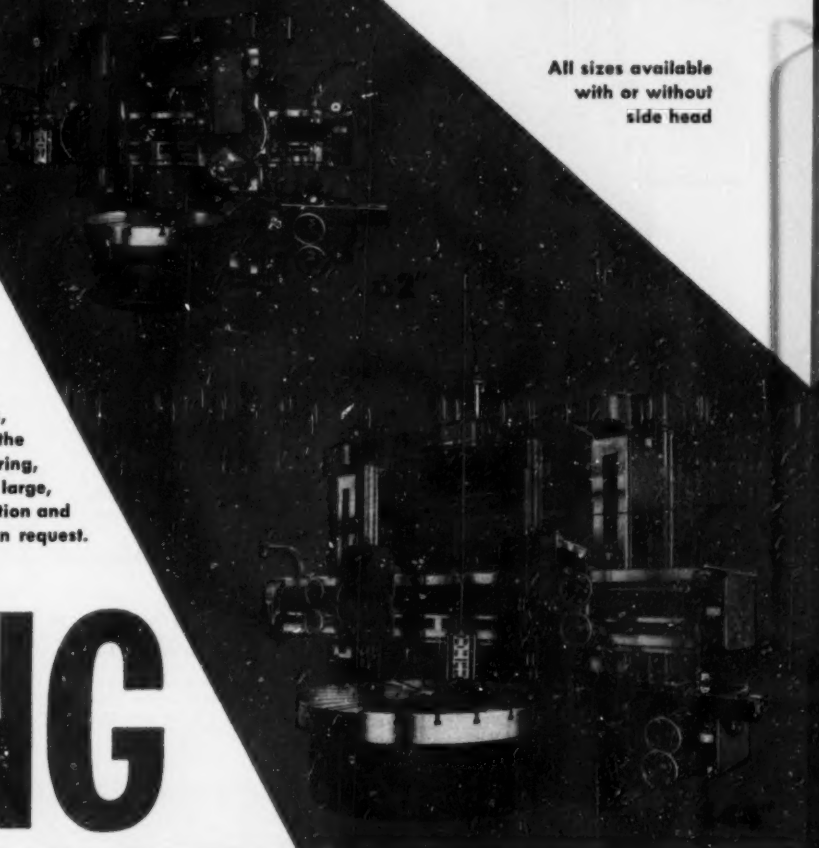
For special applications, Drilling and Tapping Units with or without attachable heads are available individually.

10 SIZES...

Single Column } **30", 36", 42"**

Double Column } **52", 62", 72", 84", 100", 120", 144"**

All sizes available with or without side head



Widest SIZE RANGE

among general-purpose vertical boring & turning machines is the KING Size Range... 10 sizes, from 30" to 144"... providing the *right* mill for your particular boring, facing, and turning work — large, medium, or small. Full description and specifications sent promptly on request.

KING

VERTICAL BORING & TURNING MACHINES

KING MACHINE TOOL DIVISION

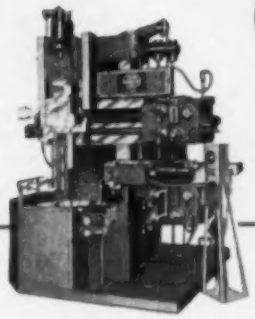
CINCINNATI 29, OHIO

Builders of King Vertical Boring & Turning Machines and Sebastian Lathes

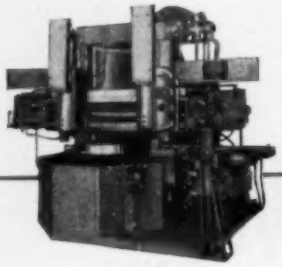
INDUSTRY SELECTS

BULLARD

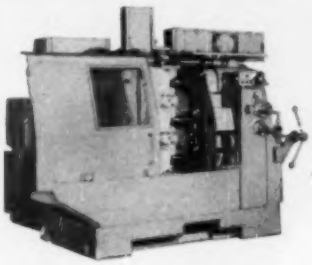
Man-Au-Trol V. T. L.'s in six sizes 30" — 36" with two heads 42" 54" — 64" — 74" with three heads



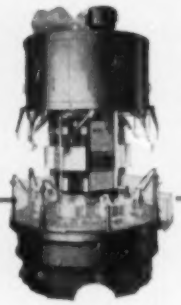
36" Man-Au-Trol Vertical Turret Lathe



54" Man-Au-Trol Car Wheel Lathe

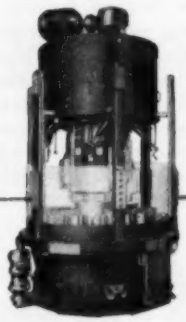


Man-Au-Trol 3 Spindle Horizontal Lathe

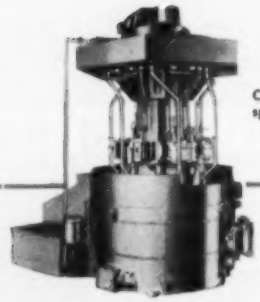


Mult-Au-Matic Type "D"

Mult-Au-Matic Type "D" 8" — 12" — 16" with 6 or 8 spindles, Type "D" 16-23 and Type "K" 6 spindles — twin 6 spindles — 8 spindles and twin 8 spindles



Mult-Au-Matic Type "K"



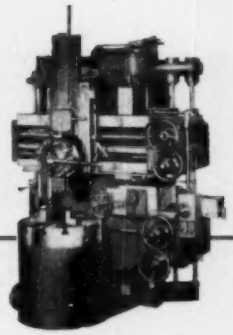
Contin-U-Matic Types "RD" and "RDH" 3 and 6 spindles in 10" — 14" — 20" and Twin Spindle

THE

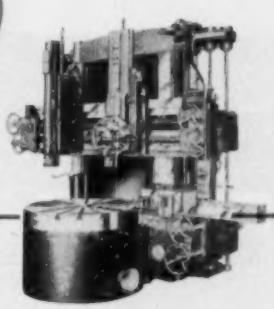
for Manufacturing Economy

BULLARD

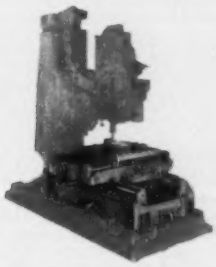
Cut Master Vertical Turret Lathes in six sizes 30" — 36" — 42" — 54" — 64" and 74". The 30" and 36" sizes have two heads while 42" — 54" — 64" and 74" have three heads obtainable in various combinations



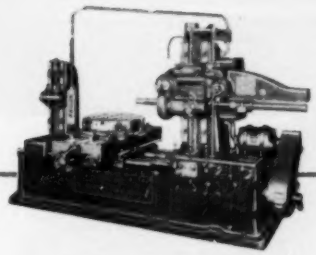
30" Cut Master Vertical Turret Lathe



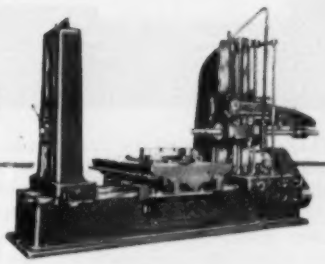
54" Cut Master Vertical Turret Lathe



30 x 20 Spacing Table mounted on Super Service Drilling Machines. It may also be mounted on 4' — 5' or 6' Radial Drills



3" Spindle Bullard-Universal Horizontal Boring Machine



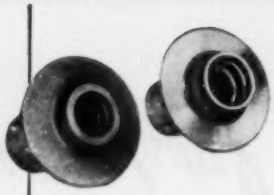
4" Spindle Bullard-Universal Horizontal Boring Machine

3" — 4" and 5" Spindle Bullard-Universal Horizontal Boring, Milling and Drilling machines are available with various Bed Lengths and Post Heights

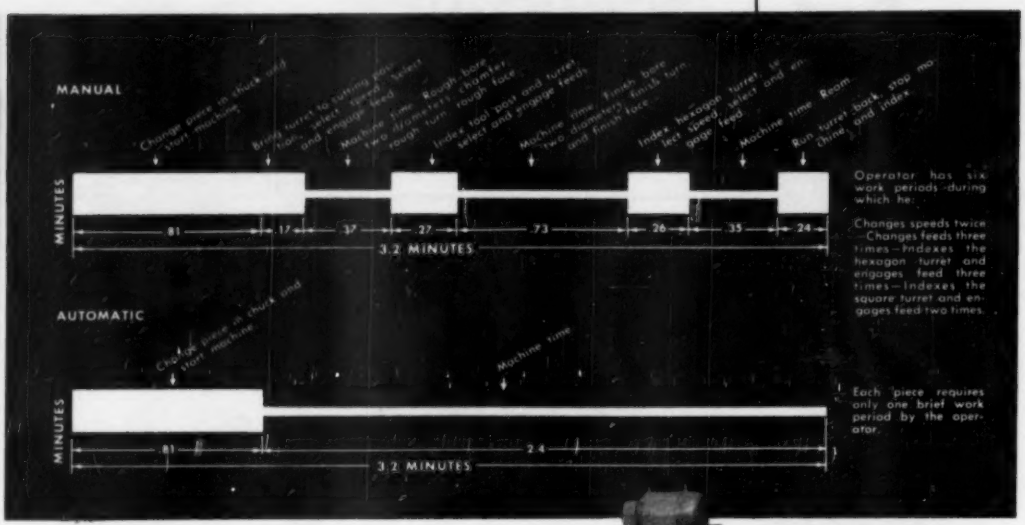
BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT U.S.A.

how the
GISHOLT FASTERMATIC
saves man-minutes and money!



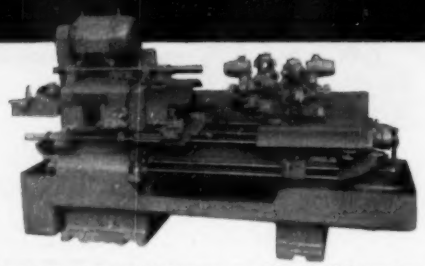
Here is an actual comparison of the time and work cycle of a manually operated turret lathe and a Gisholt Fastermatic Automatic Turret Lathe. The machining of wheel hubs, shown above, requires 6 operations as follows: rough bore, finish bore, ream, rough face, finish face and chamfer. Note that the manually operated machine takes over 54% of the operator's time whereas the Fastermatic takes only 25% of his time, leaving 75% without interruption.



That's the story of the Fastermatic in a nutshell—less work time for the operator. The Fastermatic handles all changes of feeds and speeds automatically.

In this case, for example, the other side of the work piece is done by another Fastermatic with substantially the same cycle. One operator keeps both machines constantly under cut and still has ample time for stacking and work inspection. Important, too, is the fact that both Fastermatics are tended by a comparatively unskilled operator.

There are many such cases where Fastermatics can cut costs substantially. Gisholt engineers will gladly answer your questions. Write us.



THE GISHOLT 1-F FASTERMATIC—*smallest of 3 different sizes which enable you to machine a maximum number of surfaces in one chucking, handling all changes in speed and feed automatically. On this job, turret was double-tooled so that two parts were completed with each revolution of the turret. Ask for literature.*

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.*

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

The two G-E double-blower unit-cooled d-c motors shown at left, each rated 100 hp, operate the main drive and reel on a single-stand 2-high skin-pass mill, installed at Detroit Steel Corporation's Eastern Mill Division Plant at New Haven, Connecticut.

self-protected...to cut installation costs!

In dusty, dirty or oil-laden atmospheres—where open motors can't take it without special protection—you can cut installation time and costs to a minimum with General Electric totally-enclosed unit-cooled d-c motors. Motor and unit cooler, completely factory-assembled as a unit, come to you ready to install. They need no specially-built motor room, no piping, ductwork, coolant, filters or pressurized air supply. You simplify plant layout, save extra equipment cost!

These better-protected, better-cooled G-E motors—available in ratings from 15 to 200 hp—also

. . . **minimize inspection shutdowns!** Windings, brushes and brush rigging are kept clean at all times because harmful air-borne materials can't get into the motor's internal ventilating air.

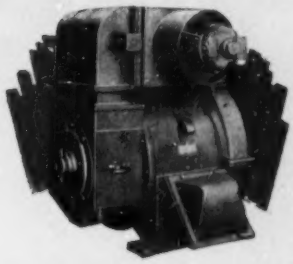
. . . **reduce power cost!** Because motor heat is rapidly dissipated, power consumption is less, especially in wide-range adjustable-speed motors.

. . . **simplify maintenance!** Large openings in the commutator end shield make it easy to get at commutator, brushes, and brush rigging.

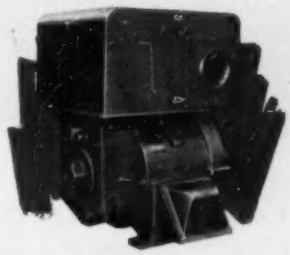
. . . **save mounting time!** Interchanging of motors to meet changing mill conditions takes less time because G-E totally-enclosed motors have the same mounting dimensions as G-E open motors of the same ratings.

Get the whole story! Ask your G-E representative how these sturdy, protected motors can help trim operating costs in *your* mill, or send for Bulletin GEA-4469. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

A choice of types to meet your needs



In single-blower type— for constant and adjustable speed operation at normal speed—unit cooler circulates internal air with a shaft-driven fan. External air is forced through alternate air passages by a separate motor-driven blower.

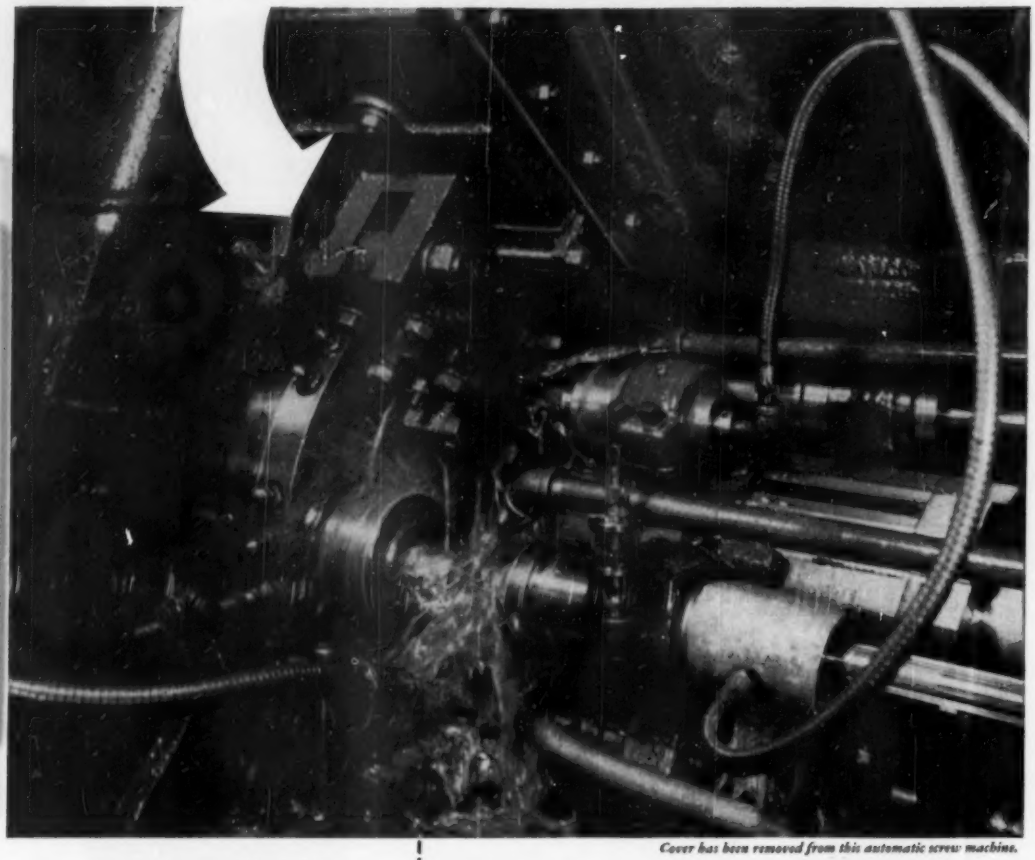


New double-blower type— can be operated continuously without harmful overheating, even at very low speeds. A single Tri-Clad® auxiliary induction motor drives both blowers, one for internal motor air, the other for external cooling air.

GENERAL ELECTRIC

170-18

HERE is



Cover has been removed from this automatic screw machine.

HERE'S A NEW STEEL THAT MACHINES EVEN FASTER THAN UNION SUPERCUT (B-1113)

... it may save you money!

If you're familiar with Union Supercut, you probably know that for many years this *original* high-sulphur steel was the fastest-machining Bessemer available. Today, however, there is some demand for even higher machinability —*for which Union Drawn has developed a new Bessemer steel* (B-1113-X). If your products and equipment are such that higher speeds and even longer tool life are practical, production-wise and cost-wise, a Union Drawn Field Service Man will be glad to discuss its possibilities.

where you can profit

from Union Drawn's Improved

MACHINABILITY

For years, *steel parts quality has been going up . . . unit costs coming down.*

That, in a few words, is what has resulted from *a continuous improvement* in Republic Union Cold Drawn Steel Bars. That is what you can learn for yourself by using these bars on production runs of duplicate steel parts on an automatic screw machine.

In every Union Drawn mill and laboratory, it's a 60-year-old tradition that MACHINABILITY comes first. As a result, many improvements have been and still are being made in Union Free Cut (B-1112), Union Supercut (B-1113) and their companion carbon, alloy and stainless steel grades.

Today, Union Drawn customers have learned to expect a high uniformity throughout bar after bar and shipment after shipment . . . and that one lot will machine just as readily as any other lot. They expect freedom from abrasive elements and long tool life. They expect smooth, bright machined surfaces. They expect high production efficiency and low unit costs for their steel parts.

They've learned to expect all these things, because they've been getting them for years.

The same experienced metallurgists and engineers who have been spending their time in customers' plants making certain that they get best possible results from Republic Union Cold Drawn Steel Bars are ready to help you, too. Call your nearest Republic District Sales Office or write us.

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

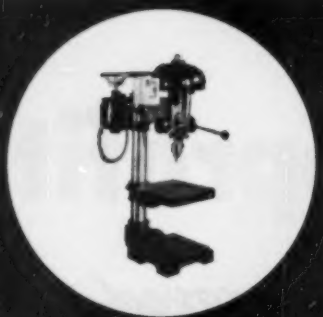
Republic

REPUBLIC STEEL ®

US

UNION COLD DRAWN STEELS

Free-Machining Bessemer, Alloy and Enduro Stainless Steels
•
Union Cold Drawn Special Sections
•
Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting.)



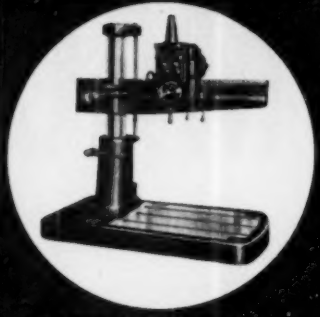
16" Royal sensitive bench and floor drill, single and multiple spindles. Bulletin 216.

21" Box column sliding head floor drill, single spindle. Bulletin 100A.

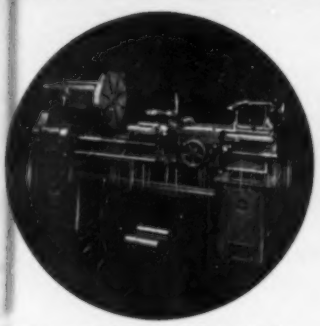
16" Box column sliding bench and floor drill, single spindle. Bulletin 155V, 119, 215.

21" Box column sliding head floor drill, multiple spindle. Bulletin 100A.

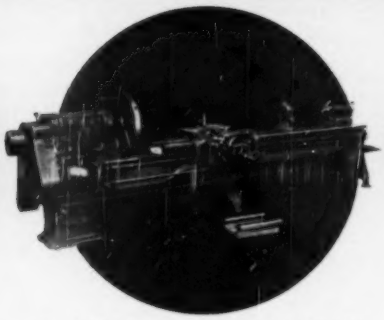
18" Royal sensitive bench and floor drill, single and multiple spindle. Bulletin 218.



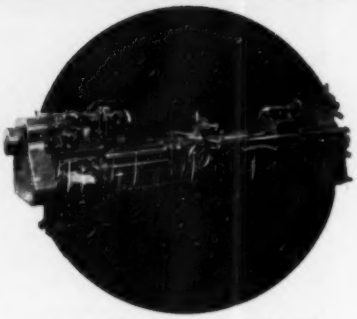
Radial drills—3', 4', 5' arms; 7", 9" and 11" column, Bulletins 116 and CO-15.



Tray-top fixed gap bed Engine Lathes —15 & 18 swing sizes. Bulletin T-100



Standard fixed gap bed Engine Lathes—14, 16, 18, 20, 22 & 24 swing sizes. Bulletin S-100



Standard Engine Lathes—14, 16, 18, 20, 22 & 24 swing sizes. Bulletin S-100

Tray-top Engine & Tool-room Lathes—10, 12½, 15 & 19 swing sizes. Bulletin T-100

+ plus value

Cincinnati Lathe & Tool Co. announces with pride the acquisition of one of the largest, oldest, and most widely recognized lines of light, upright, sensitive, and radial drilling machines – formerly produced by The Canedy-Otto Manufacturing Company. So now, from one organization, you can obtain the best in economy priced drilling machines and accessories as well as medium (Standard) and light duty (Tray Top) lathes, backed by a leading name in lathe manufacture. Write today for new catalogs.

cincinnati LATHE & TOOL COMPANY

OAKLEY, CINCINNATI 9, OHIO

\+ CANEDY – OTTO

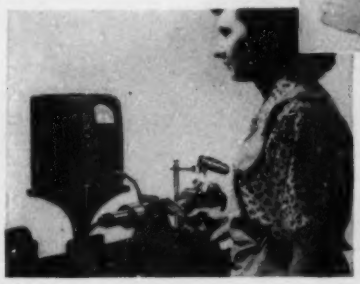
ELECTRONIC MEASURING EQUIPMENT

This equipment provides a reliable means for taking external and internal measurements with precision and ease that advance accurate manufacture and size control. By a simple turn of graduation selector, tolerances can be checked from "tenths" to "hundredths".

Exclusive advantages: any graduation value between .0001" and .00001" . . . separate amplifier completely isolates heat-producing elements . . . true linear response of amplifier permits accurate setting for entire scale with only 1 gage block . . . amplifier may serve several separate testing instruments.

External comparator with range of 0-4". Simplified setting. One master only. Reversible anvil. Self-checking. Shock-protected. Diamond gaging point.

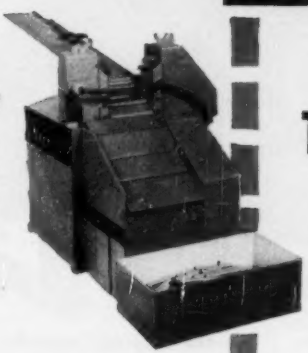
Internal comparator attachment for use with external comparator and amplifier . . . range ½" to 2". Frictionless. No parts to wear. Only one master.



Gage head cartridge for mounting in jigs, fixtures or similar testing pieces. Measurement range .002". Frictionless. Dust and moisture proof.

ELECTRONIC INSPECTION AND SORTING EQUIPMENT

Unique design . . . manual loading and disposal to fully automatic . . . custom-engineered at Brown & Sharpe to meet individual requirements. Simplification of parts and functions makes machines more compact, more dependable.



JOHANSSON GAGE BLOCKS

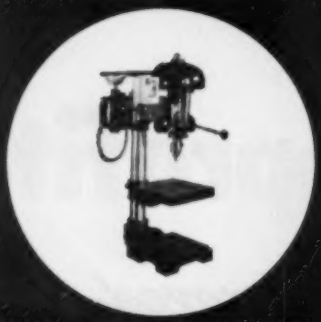
. . . world famous both for their extreme accuracy and for their fast-growing importance to manufacturing of interchangeable parts. These precision aids to quality control are made by Brown & Sharpe; from single blocks to complete sets and useful accessories. Jo-Blocks have hundreds of cost-saving uses.

Take your cost cutting cue from this QUALITY CONTROL EQUIPMENT

With any one of these modern quality control devices, you can lay the foundation for an efficient, cost-cutting quality control program. Each device offers thoroughly-proven features that broaden the advantages of quality control. All reflect the high precision standards associated with the Brown & Sharpe name. For complete details, write Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor

BROWN & SHARPE



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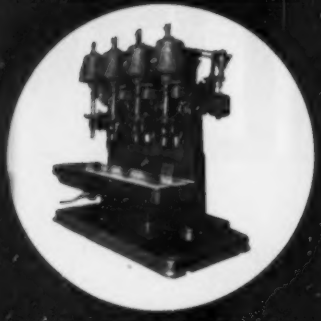

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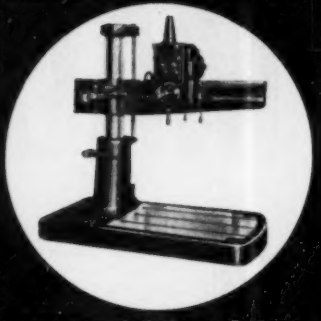

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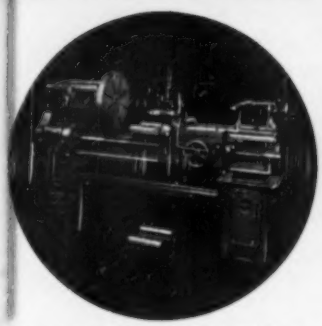
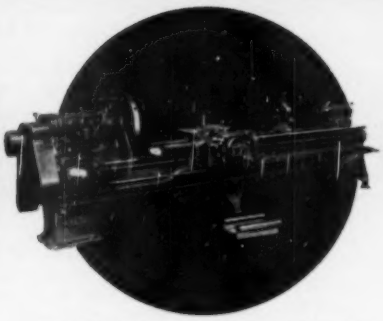
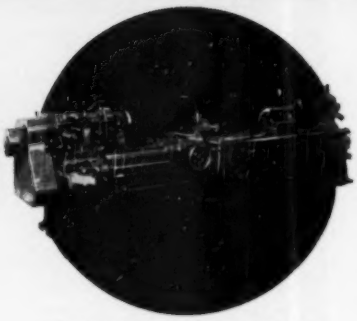


Tray-top fixed gap bed Engine Lathes —13 & 18 swing sizes. Bulletin T-100



Standard fixed gap bed Engine Lathes—14, 16, 18, 20, 22 & 24 swing sizes. Bulletin S-100



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External comparator with range of 0-4". Simplified setting. One master only. Reversible anvil. Self-checking. Shock-protected. Diamond gaging point.

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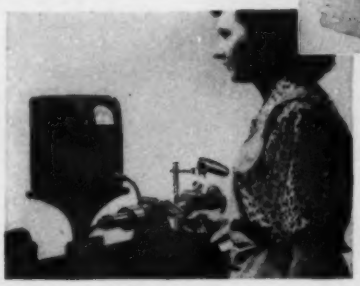

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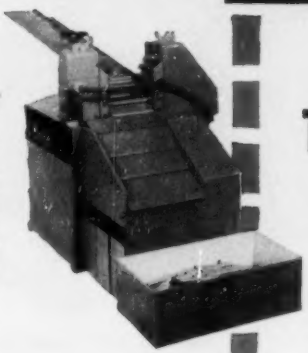
ELECTRONIC INSPECTION AND SORTING EQUIPMENT



Unique design . . . manual loading and disposal to fully automatic . . . custom-engineered at Brown & Sharpe to meet individual requirements. Simplification of parts and functions makes machines more compact, more dependable.

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We urge buying through the Distributor

BROWN & SHARPE

Cost of making CONDUIT COUPLING BLANKS greatly reduced by

Automatic LOADING and WORK TRANSFER TABLES

AS PICTURED ABOVE, 16 to 24 foot lengths of pipe are being automatically roller fed, from a Bardons & Oliver Automatic Loading Table, into a Bardons & Oliver No. 34 Hydralectric Cut-off Machine, which automatically outside chamfers both ends and cuts off the conduit coupling blanks.

After being cut off, the conduit coupling blanks are automatically delivered, by a Bardons & Oliver motor driven Transfer Table . . . to a second operation machine, for the internal chamfering of both ends.

From the time of dropping a bundle of pipe onto the Loading Table, to when the finished conduit couplings roll out, no human hand touches the work. Only one operator is required for the complete layout.

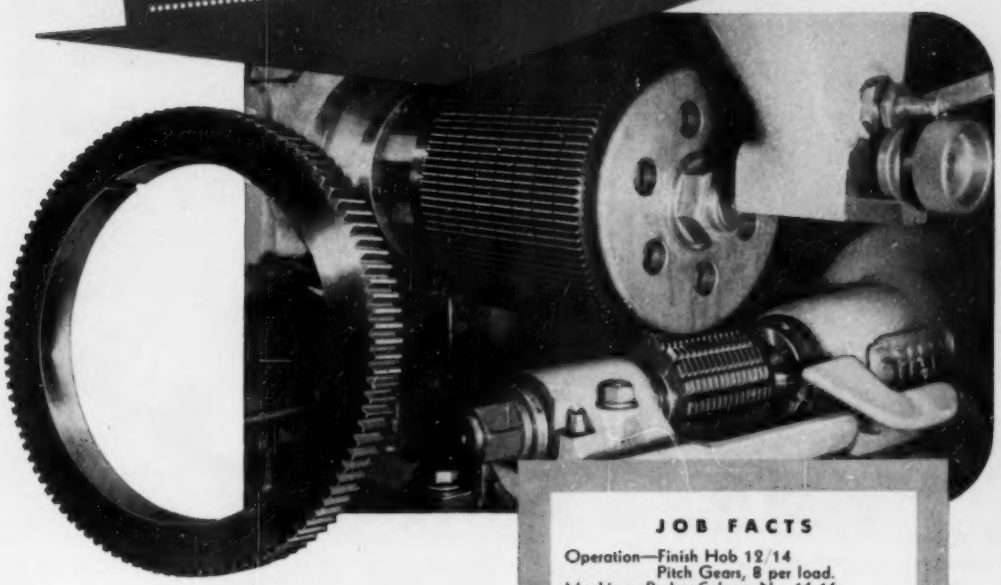
Bardons & Oliver Automatic Loading Tables and Transfer Tables can be furnished to handle a wide variety of parts made from tubing or pipe, so we suggest that you call on us for our engineering advice and assistance.

We build a full line of ram and saddle type turret lathes, as well as a complete line of cut off machines.

BARDONS & OLIVER, INC.

1133 WEST 9TH STREET • CLEVELAND 13, OHIO

MORE GEARS IN LESS TIME!



JOB FACTS

Operation—Finish Hob 12/14 Pitch Gears, 8 per load.
Machine—Barber-Colman No. 16-16.
Hob—Barber-Colman Ground "Multithread" Hobs.
Material—Steel forgings.
Feed—.054"/rev. of work Speed—139 RPM
Fl-to-Fl—60 minutes per load.
Accuracy—Roll with master gear. Kickout within .002".

With

BARBER-COLMAN "MULTITHREAD" HOBS

Finish, production, tool life — all 3 have improved with a changeover to Barber-Colman *"Multithread"* hobs on this finish hobbing operation. The use of *"Multithreads"* depends on machine conditions and the particular characteristics of the gears to be cut. Under the proper conditions, as in this case, more gears are produced in less time, with substantial production savings. This job, for example, shows 25% better finish, 24 more gears per hob setting, 10 more settings per sharpening, and production time cut from 95 to 60 minutes per load.

We are anxious to demonstrate what *"Multithreads"* can do for other production hobbing jobs, and we invite questions and job specifications. Ask your Barber-Colman representatives for an analysis of *"Multithreads"* on your jobs.

Barber-Colman Company

GENERAL OFFICES AND PLANT, 7104 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.

METHODS ENGINEERS!

Get this free data on hob performance and accuracy, a complete case history record, without obligation. Send request on company letterhead for File No. 7184

Illustrating some of the many parts which have been profitably broached. Included below are wrenches, pliers, wheels, spindles, gear blanks, clutch hubs, and many others.

Cut Production Costs by Broaching the *American* Way

The parts shown are excellent examples of the wide variety of irregular shaped parts that can be broached. In this photo there are serrations, slots, notches, radii, and flat surfaces which have been surface broached. There are involute splines, rectangular holes, helical splines, serrations, and round holes which have been internally broached. If you produce parts requiring similar machining, you should . . .

INVESTIGATE BROACHING

There are several ways in which broaching can lower costs and improve production. On multiple station units a part can be broached at each station at the same time, greatly increasing the production, or each station can broach a different surface thus completing two or more operations on a single part. Completely automatic continuous broaching cycle, with the operator only loading the magazines, can also be provided when the part permits, for exceptionally high production requirements.

INVESTIGATE *American*

American engineers will work with you to simplify your metal cutting problems. Consult American and get the advantages of a complete broaching service. American builds every type of broaching machine and provides a size and capacity to handle every broaching need. They will design and build your broaches and the work fixture to give you the maximum benefits of broaching. Write to American. If you can, send a part print or sample part, and hourly requirements. Write Dept. A.

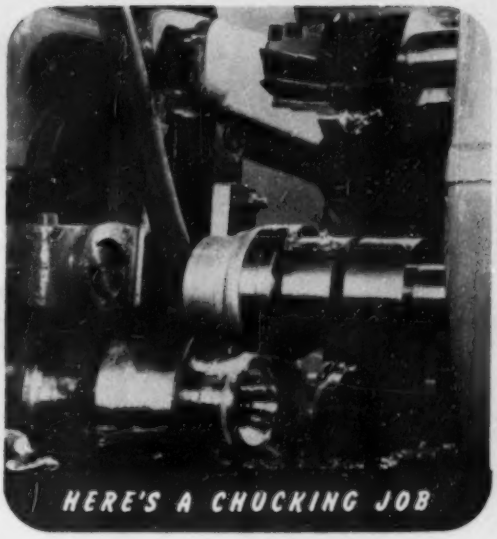
AMERICAN *American* BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

See *American* First—for the Best in Broaching Tools, Broaching Machines, Special Machinery

HERE'S A BAR JOB



HERE'S A CHUCKING JOB

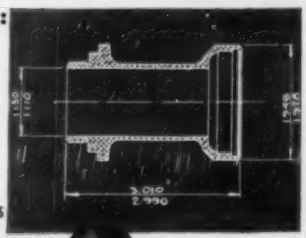
BOTH Jobs machined on the new DIALMATIC CLEVELAND

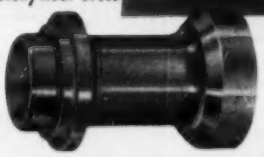
BAR JOB DATA:

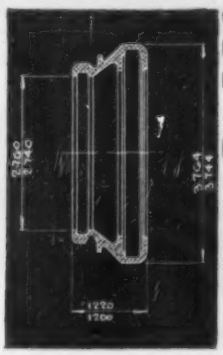
PART: Housing

MATERIAL:
Aluminum Bar Stock

PRODUCTION:
75 Pieces/Hour Gross







CHUCKING JOB DATA:

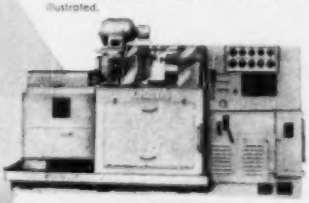
PART: Coupling

MATERIAL:
Aluminum Forging

PRODUCTION:
53 Pieces/Hour Gross

Machine illustrated above built for Marcus Mason and Company, Inc., designers of the parts illustrated.

Cleveland Dialmatic 2½" Model AB Single Spindle Automatic. For machine design, construction and specification details, write for descriptive bulletin.



The most versatile single spindle automatic screw machine in the field! The Model AB Dialmatic Cleveland is *easily* and *quickly* convertible from a bar machine to a chucking automatic by substituting a simple, low-cost chucking attachment for the stock feed group in the spindle.

If you are producing steel, brass or aluminum parts up to 2½" diam. from bar stock—and doing an occasional chucking job on pieces up to 6" diam.—find out now how much you can lower your production costs with the new Dialmatic Cleveland. Cleveland engineers will be pleased to submit a direct proposal with production estimates on your work.

Remember, *Clevelands Cut Costs*

4928 BEECH ST.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

Cincinnati 12, Ohio

SALES OFFICES: CHICAGO
CLEVELAND • DETROIT
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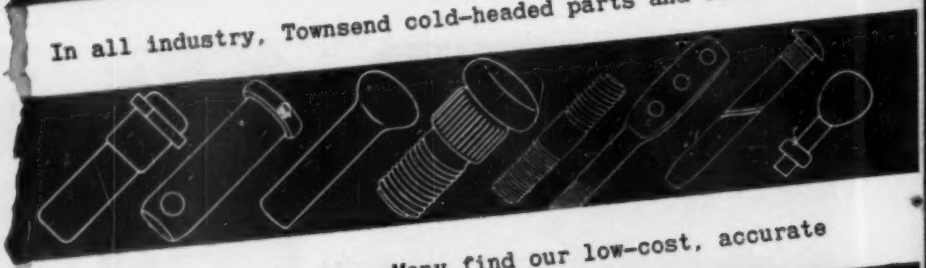
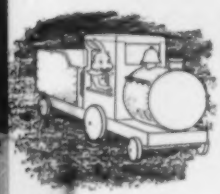
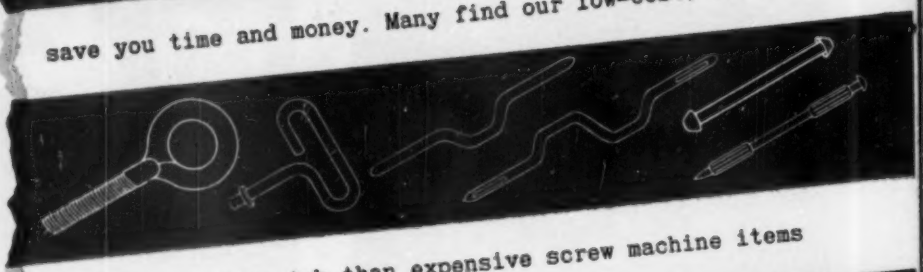
Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

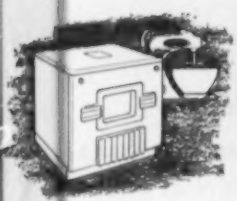
In all industry, Townsend cold-headed parts and fasteners



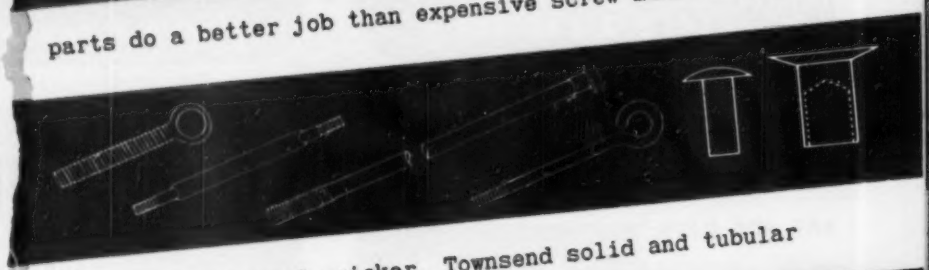


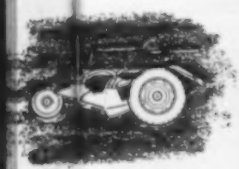
save you time and money. Many find our low-cost, accurate



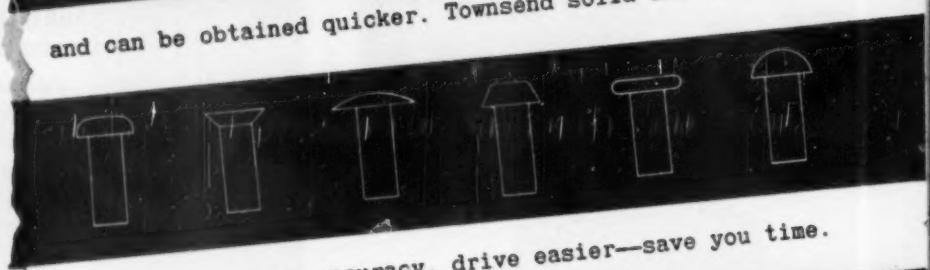


parts do a better job than expensive screw machine items

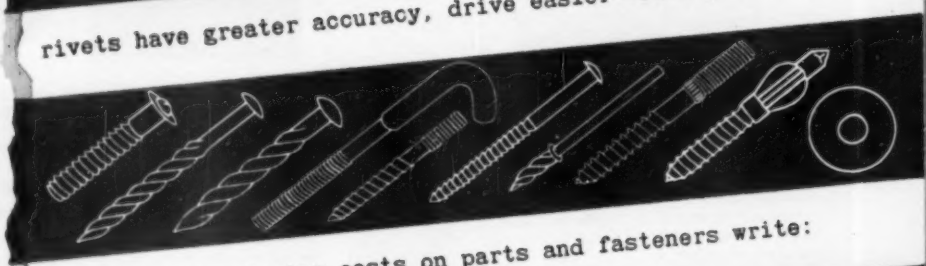


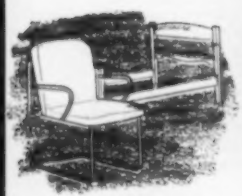


and can be obtained quicker. Townsend solid and tubular



rivets have greater accuracy, drive easier—save you time.





For help in reducing costs on parts and fasteners write:

Townsend

COMPANY — ESTABLISHED 1816

New Brighton, Pa.

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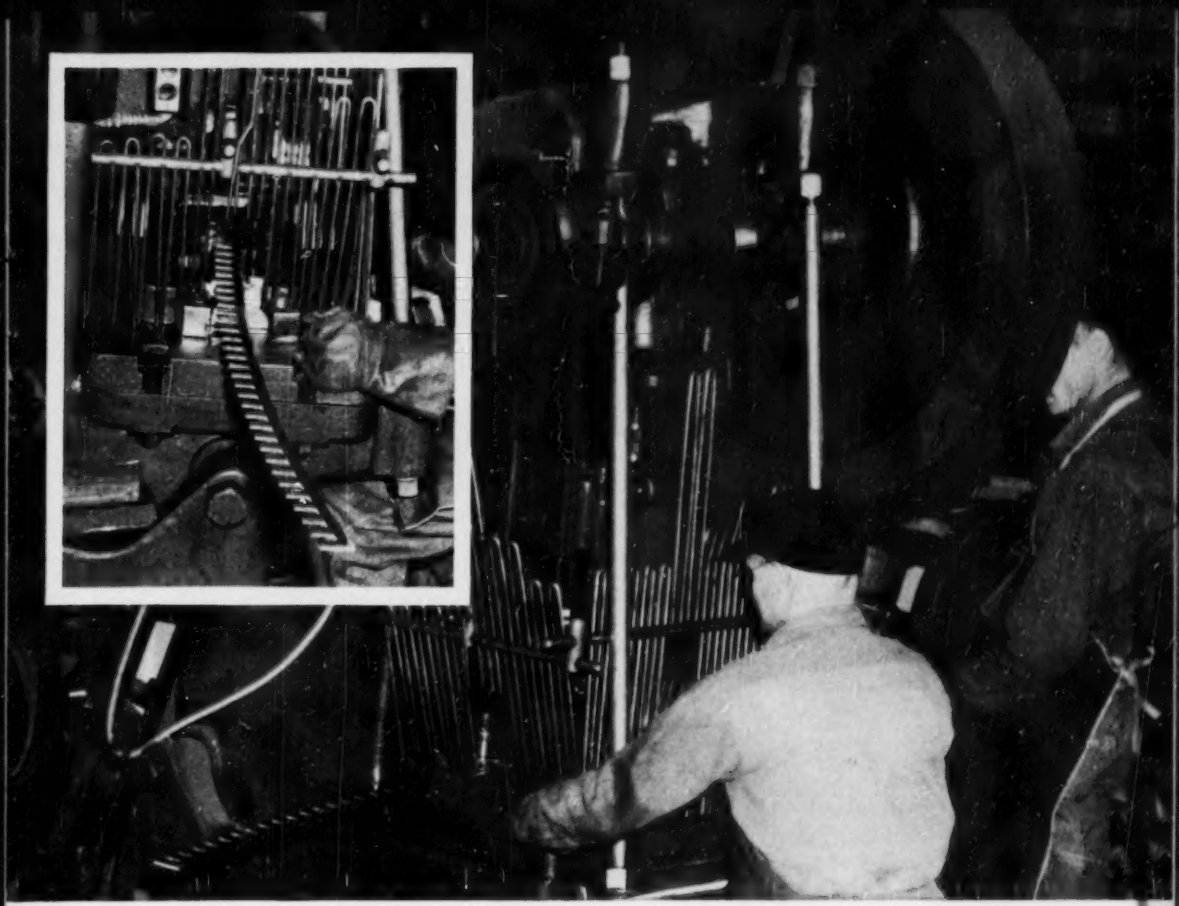


Put more life into your punches

AN UNUSUAL METHOD of making ring gears was adopted by the Gibson Manufacturing Company, Oostburg, Wisconsin. The gears are punched from bar stock of mild, hot-rolled steel in thicknesses of ¼" and 5/16".

The operation, however, posed certain problems. As a die lubricant, a cutting oil containing lard oil was used. Corners of the punch kept chipping out. Regrinding was necessary at fifteen-hour intervals. Rejections ran 15%. Only 200 pieces could be produced between grinds. Various base oils were tried. Each failed to bring the desired improvements.

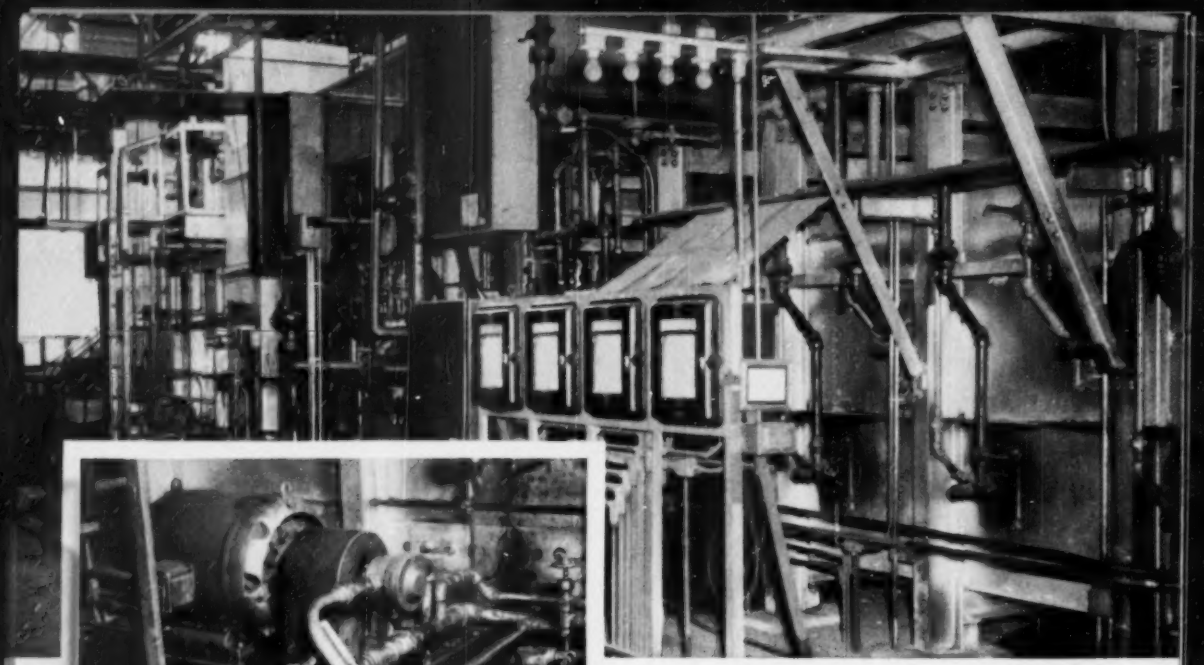
At the suggestion of a Standard Oil Cutting Oil Engineer, the operation was switched to Stanostamp S Compound. Chipping troubles ended. Parts came out cleaner. Rejections ran to only 1%. On top of all this, production between grinds jumped to 450 pieces—an increase of 125%.

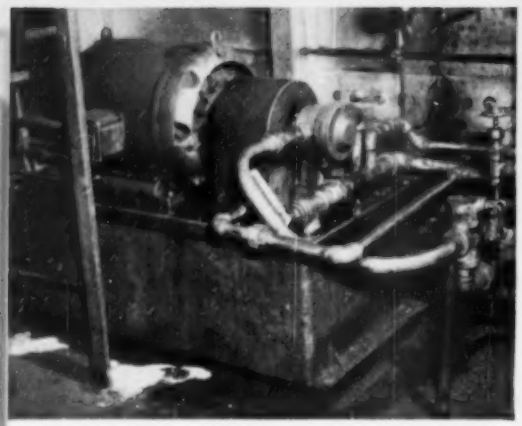
Stanostamp S Compound

These remarkable benefits are typical of those you can obtain on all types of drawing and stamping operations with Stanostamp Compounds. A Standard Oil Cutting Oil Engineer will help you choose the right grades for your jobs.

If your plant is located in the Midwest, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, to secure the services of the Engineer nearest you.

STANDARD OIL COMPANY (INDIANA) STANDARD





STANOIL
Industrial Oil

How to make your hydraulic operations more reliable

EQUIPMENT like that shown above is used for hardening automotive crankshafts in a midwest plant. Each unit consists of a hardening furnace and an automatic quench tank. Hydraulic units, operating through panel control boxes, move the crankshafts through the furnaces and tanks at prescribed depths and at fixed time cycles.

Because of manufacturing requirements, hydraulic units must operate continuously without shutdown for cleaning. At the same time, they must function perfectly to permit accurate control of furnace operations.

Stanoil 15 has enabled the hydraulic units to meet fully these two stringent demands. There have been no difficulties due to stuck valves. The hydraulic units have responded smoothly and promptly to controls. Oil systems have remained clean and free from deposits.

You can rely on Stanoils to give you the same clean, dependable operation of hydraulic units and of speed reducers and circulating systems as well. These unique, multi-purpose oils can replace many special and costly oils in your plant. A Standard Oil Lubrication Engineer will be glad to help you obtain the most economical use of Stanoil.

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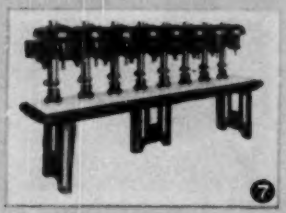

DELTA® — *the most complete line*

gives you the best drill press for every job — *at the best price!*

When you need a "drill press" think of *Delta!* Most people do — and no wonder. You're sure to get the right drill press when you buy Delta. You select from *the most complete line,* and the only line with complete accessories.

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That's why it pays to select the *right* drill press for your job from *the complete Delta line.* The same goes for other metalworking and woodworking tools — see Delta first!

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Motor and switch extra.
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M-48

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Photograph shows operators cutting ⅝" plate and 20 gage sheet steel simultaneously on NIAGARA Power Squaring Shear. No change in knife adjustment is necessary.

The ability of Niagara Power Squaring Shears to cut thick and thin plate both at the same time with the same knife setting is a dramatic demonstration. Visitors at our plant can see this done every day. There is no necessity for tinkering with the knife adjustment.

Demonstrates The Sound Engineering Design of

NIAGARA

POWER SQUARING SHEARS

● There is no compromise with sound, proven engineering when it comes to NIAGARA shear design and construction.

Accurate cutting depends primarily on rigidity of the shear's components.

For bed, crosshead and holddown NIAGARA uses CLOSED BOX SECTIONS to resist with minimum deflection the horizontal, vertical and diagonal or torsional loads to which every shear is subjected.

NO OTHER SECTION WILL DO THIS JOB AS EFFICIENTLY.

Angle or channel shaped sections have long since been abandoned for use on NIAGARA Power Shears.

The economy of quality is remembered long after price is forgotten.

BED, CROSSHEAD & HOLDDOWN DESIGN

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, NEW YORK

DISTRICT OFFICES: DETROIT, CLEVELAND, NEW YORK

SUN "JOB PROVED" PRODUCTS CUT COSTS,

Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power, and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering, and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of many kinds.

To help you solve your production problems, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking. Call your local Sun office, or write Dept. AM-1.

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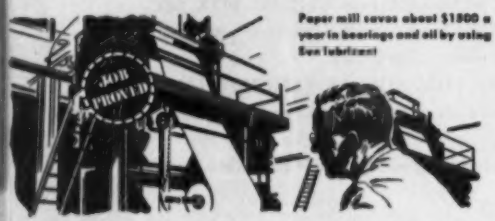
INDUSTRIAL OILS

SUNVIS 900 OILS—High-viscosity-index, paraffinic-type oils—of uniform O F pour point—fortified against rust, corrosion, oxidation, and sludge. The finest available lubricant for turbines, hydraulic systems, and similar applications.

SUNVIS HD 700 OILS—High-viscosity-index oils containing additives which minimize oxidation and give detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse conditions.

SUNVIS OILS—Solvent-refined paraffinic-type oils of uniform high viscosity index, low pour point, and low carbon content. Especially suitable for application to long-time use in all types of industrial reservoirs and circulating systems.

DYNAVIS OILS—Low-pour-point, high-viscosity-index, inhibited oils, containing an additive which helps prevent formation of harmful corrosive and sludge-forming acids. Well suited for engines fitted with alloy bearings and operated at high temperatures.



Paper mill saves about $1800 a year in bearings and oil by using Sun lubricant

SOLNUS OILS—Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in machine tools, air compressors, certain types of diesels, etc.

CIRCO OILS—Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNTAC OILS—100%-petroleum products which have been compounded to increase their adhesiveness. Recommended for general lubrication of all machines subjected to sudden shocks and load reversals. Cling to the parts to be lubricated.

STEAM CYLINDER OILS—High flash and fire point lubricants for either saturated or superheated steam conditions and for worm-gear speed-reduction units.

SUN CAR JOURNAL OILS—Dark oils meeting A.A.R. Specifications. For use in waste-packed bearings of railroad equipment.

SUN DELAWARE OILS—Dark oils for general lubrication on older types of industrial machinery.

SUNOCO WAY LUBRICANT—For use on tableways. Eliminates chatter and scoring . . . resists corrosion. Has good metal-wetting and adhesive properties, ample viscosity, and E. P. qualities.

SUN MARINE ENGINE OILS—Compounded with special emulsifying agents in order to provide adhesion to, and lubrication of, working parts in the presence of water. For the lubrication of bearings, eccentrics, crossheads, and various other parts of steam engines.

ROCK DRILL OIL—High-film-strength adhesive oil. For use in jackhammers, stopers, drifters, and similar equipment.

INDUSTRIAL GREASES

SUN CUP GREASES—Water resistant. For grease-cup and grease-gun application when service is normal.

SUN GUN GREASES—Smooth greases made with medium-viscosity oil. Stable under pressure in power and booster guns.

ADHESIVE PRESSURE GREASES—Won't drip or splash. Excellent lubricants for open-gear applications.

SUN DARK PRESSURE-SYSTEM GREASES—For power-driven central grease lubricating systems in heavy industries. Also used as a "medium cup grease."

SUN MINE CAR GREASES—Available in several grades. Suitable for both antifriction bearings and plain-bearing cavity-type wheels.

SUN MINING MACHINE LUBRICANT—Semifluid. For use where a light but adhesive grease is required. Resists separation and decomposition.

Chemical plant saves about $8000 per year by adopting Sun Pressure Grease

SUN ROLLER BEARING GREASES—For use on electric motors and generators and high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS—Black adhesive open-gear compounds and

"JOB PROVED" IN EVERY INDUSTRY

SUN PETROLEUM

SPEED PRODUCTION, IMPROVE QUALITY

wire-cable greases. Recommended for power presses, mining machinery, worm reduction mills, crushers, pump gears, etc.

SUNOCO TRACTOR ROLLER COMPOUND—For crawler-type tractors. Provides good lubrication with exceptional sealing qualities.

METALWORKING OILS

SUNICUT—Straight (non-emulsifiable) transparent cutting oils. Recommended for automatic screw machines and heavy-duty machining operations. Permit high speed production with excellent finishes, long tool life.

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and nonferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to aid development of maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel. Because of their low carbon content and stability under heat, these oils have an unusually long service life.

Machine shop uses Sunicut 209W as a cutting and lubricating oil —saves up to $1000 a year

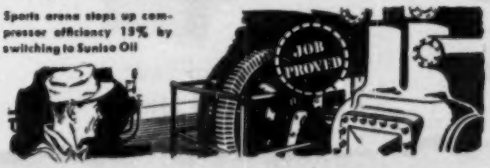
SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum, brass, and copper.

SUN ANTI-RUST COMPOUNDS—Petroleum-base oils with chemical additives designed to prevent the rusting and corrosion of steel.

REFRIGERATION OILS

SUNISO REFRIGERATION OILS—Have extremely low pour points, extremely low wax-separating characteristics, a high degree of stability and long life. Initially neutral and resistant to formation of detrimental acids under service conditions. Suniso Oils are high quality oils suitable for both high- and low-temperature operations. The most widely used oils in refrigeration and air-conditioning.

Sports arena steps up compressor efficiency 15% by switching to Suniso Oil



TEXTILE-PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water. Highest rating in fadometer tests.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" (fine air-borne lint particles).

Worsted mill obtains easier scouring, better quality, larger yield with Sunotex WO-220

SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are kept from being damaged or broken down, and harmful dust is minimized when this product is used.

SUN CORDAGE OILS—Generally used alone, but are adaptable to various formulas used by cordage manufacturers. Selected products, highly compatible with additives.

RUBBER-PROCESSING AIDS

CIRCOSOL-2XH—An elasticator and processing aid for natural rubber and especially for GR-S. Outstanding for sponge rubber.

CIRCO LIGHT PROCESS AID—A processing agent and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber. Used for GR-S to some extent.

SUNDEX-53—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established processing aid for rubber footwear stocks and semihard rubbers.

Rubber plant cuts out production step, eliminates wrinkles and rejects with Circosol-2XH

CIRCOMAR-5AA—A black-colored product for processing natural and GR-S rubber used in tire-making. Also used in reclaiming natural-rubber scrap. Replaces asphalt fluxes. Free-flowing at room temperature.

WAXES

Sun's new wax plant was completed in 1949. Its many refining innovations and extreme flexibility permit new types of waxes to be manufactured in large quantities—a procedure heretofore impracticable. A wide range of fully refined paraffin and microcrystalline waxes will be "tailor-made" to meet the requirements of virtually all major industrial applications. Pilot plant samples of several grades are now available.

MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SOLVENTS—Sun Spirits for the thinning of paints, varnishes, and enamels, and for metal-cleaning . . . a pure, water-white petroleum solvent free of corrosive sulphur. Other Sun solvents with special properties are available for the chemical industry.

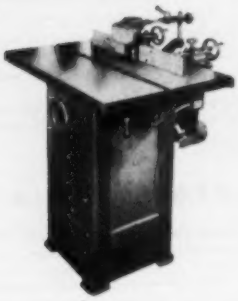
SUN LEATHER OILS—Mineral-base leather oils. Used for obtaining the desired tensile strength, proper temper, and controlled moisture content. Maintain a light even color . . . mix well . . . distribute evenly.

"JOB PROVED" IN EVERY INDUSTRY

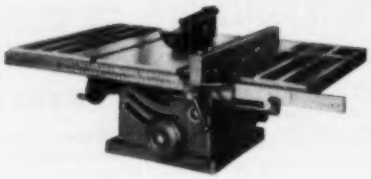
PRODUCTS

SUNOCO

WALKER-TURNER



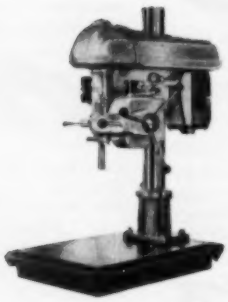
Spindle Shaper



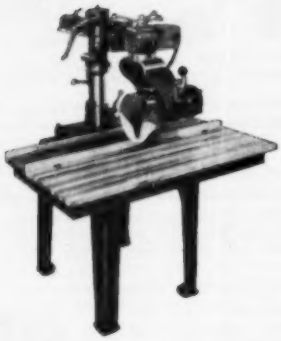
9″ Tilting
Arbor Saw

12″ Band Saw

14″ 16″ Band
Saws



15″ 20″ Drill
Presses



Radial Saw
1½ to SH.P

NEW CATALOG

The first of several new catalogs in process is now ready for distribution; write now for your free copy . . . All the latest models are fully described, the complete Walker-Turner line is illustrated. A post card will bring your copy by return mail, or ask your dealer for a copy.

MACHINE TOOLS

HELP YOU BEAR DOWN ON PRODUCTION COSTS WHEN DOLLARS ..... AND EVEN PENNIES *Count*

6" Jointer

10" Tilting Arbor Saw

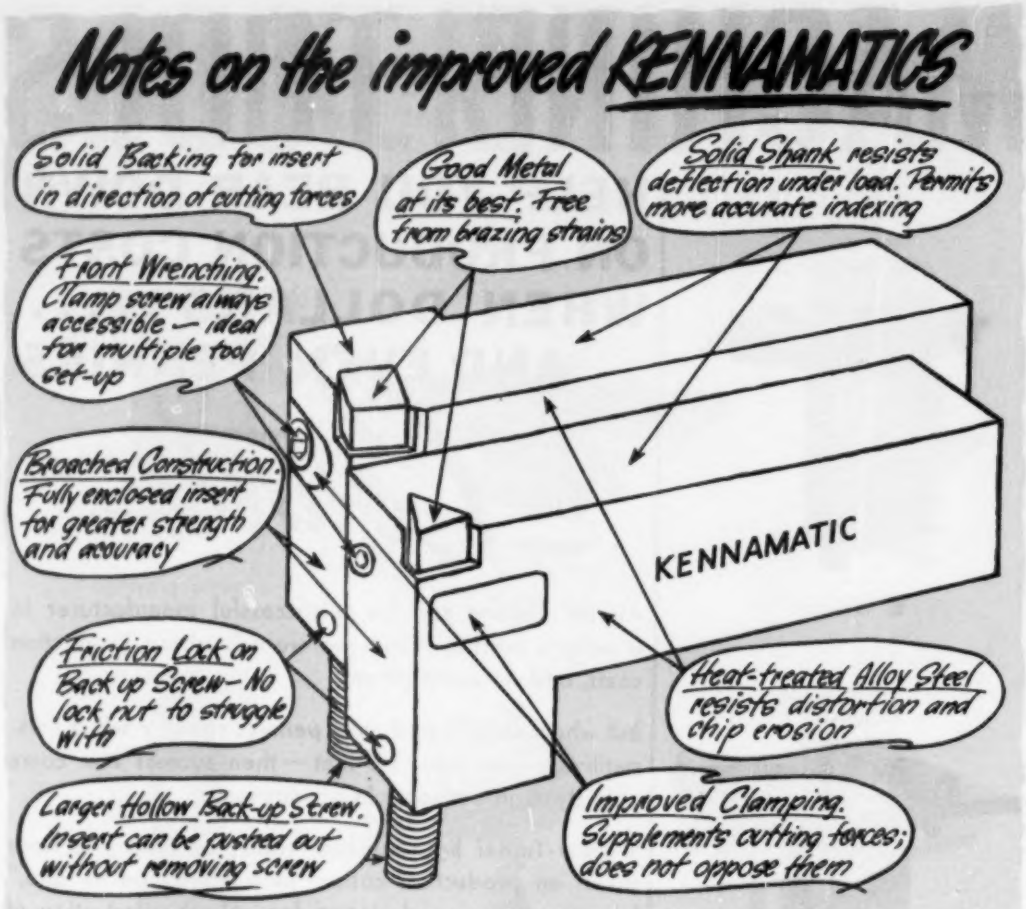
Almost anyone can be a successful manufacturer in a seller's market—with no worries about production costs, and no competition.

But when dollars, and even pennies count—when competitive prices must be met—then success can come only through economy in production.

Walker-Turner light machine tools can help you bear down on production costs—help bring you in "line," because they are designed for volume production of high quality, and are sold at popular prices.

AUTHORIZED DEALERS ONLY

Walker-Turner does not sell its products direct to users. Its machine tools, motors, accessories and repair parts are sold only by authorized Industrial Machinery Distributors who have been selected because of their Engineering and Service facilities.


Notes on the improved KENNAMATICS
Solid Backing for insert in direction of cutting forces
Good Metal at its best: Free from brazing strains
Solid Shank resists deflection under load. Permits more accurate indexing
Front Wrenching. Clamp screw always accessible — ideal for multiple tool set-up
Broached Construction. Fully enclosed insert for greater strength and accuracy
KENNAMATIC
Friction Lock on Back up Screw—No lock nut to struggle with
Heat-treated Alloy Steel resists distortion and chip erosion
Larger Hollow Back-up Screw. Insert can be pushed out without removing screw
Improved Clamping. Supplements cutting forces; does not oppose them

Kennamatic Tools have saved thousands of dollars for industry after industry because: Solid, mechanically-held, indexable insert—positioned vertically makes best use of Kennametal's great compressive strength and assures extended tool life; simplified tool setting—indexable insert has several cutting edges on both ends and therefore can be revolved on its axis, turned end over end, or replaced, without changing setting of tool holder; less grinding expense—resharpening merely requires squaring off end of insert and grinding chip breaker, if desired.

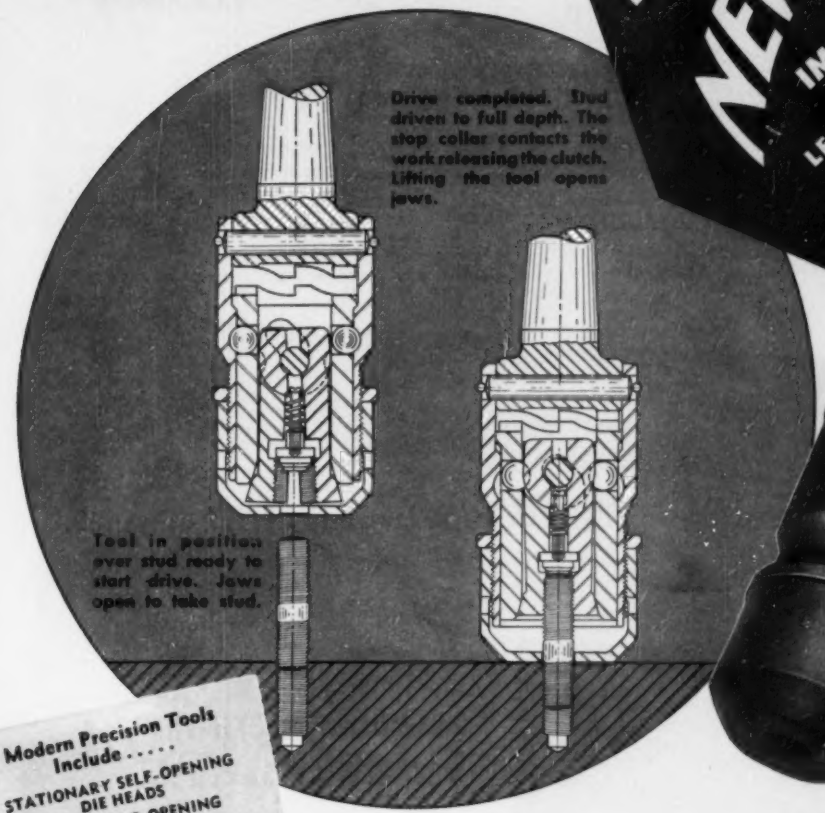
Now, a *new, improved* Kennamatic Tool Holder has been developed. This still utilizes the well-known distinctive properties of the standard Kennametal insert, and incorporates the other advantages that have proved so successful in the previous design, *plus* the novel structural features noted in the sketch. *You secure these improvements without additional cost.*

Write for Supplement 1 to Catalog 49

KENNAMETAL Inc.
LATROBE, PA.

MODERN
SELF-OPENING
STUD SETTERS

NEW IMPROVED DESIGN LESSENS COST OF STUD SETTING


Drive completed. Stud driven to full depth. The stop collar contacts the work releasing the clutch. Lifting the tool opens jaws.
Tool in position over stud ready to start drive. Jaws open to take stud.

MODERN STYLE H STUD SETTER

Modern Precision Tools Include . . . . .

- STATIONARY SELF-OPENING DIE HEADS
- ROTARY SELF-OPENING DIE HEADS
- STATIONARY COLLAPSIBLE TAPS
- ROTARY COLLAPSIBLE TAPS
- MODERN-MAGIC CHUCKS AND COLLETS
- SELF-OPENING STUD SETTERS
- INSERTED BLADE FACE MILLING CUTTERS
- SOLID ADJUSTABLE DIE HEADS
- ADJUSTABLE HOLLOW MILLING TOOLS
- UNIVERSAL CHASER GRINDING FIXTURES

Through improved design that insures longer life to the tool jaws and less down time for changes and repairs, this new Modern Style H Self-Opening Stud Setter provides the means to greater economy in stud setting. With this improved tool, it is possible to set more studs . . . in less time . . . at lower cost . . . with a minimum of thread mutilation . . . and with less wear to the tool itself.

Full information covering the advanced construction features and improved action of this new Modern Stud Setter as well as the economy possible through its adoption for your stud setting work, will be furnished immediately upon your request.

MODERN TOOL WORKS

DIVISION OF

CONSOLIDATED MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK

you can

REDUCE STAINLESS MACHINING COSTS *today*

Carpenter wants to help you do it!

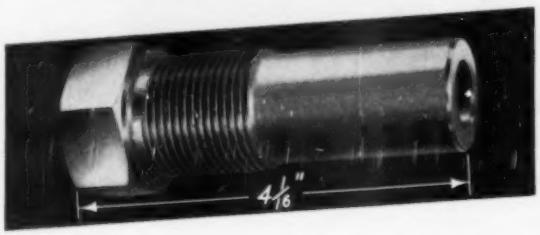
Some people feel that all free-machining Stainless Steels with the same type number are alike.

But many Stainless users have found that there is quite a difference. They are getting longer tool life, higher production and better finishes. The reason for results like these is constant uniformity on every lot of Stainless bar stock that enters their plants. For the same kind of results on your own jobs, it will pay you to specify Carpenter Stainless No. 5 (Type 416) or No. 8 (Type 303) on your next bar stock order.

Make your own comparison. Call your Carpenter Warehouse for rush delivery from local stock.

LONGER TOOL LIFE and BETTER FINISHES...

Production increased 25% on this surgical instrument job, when they changed from ordinary Type 416 to Carpenter Stainless No. 5. Costs came down because of longer runs between grinds on cutting tools. Smoother, more sanitary finishes resulted in an improved product.



MACHINED to "TENTHS" and MONEY SAVED...

This valve part, machined to "tenths" on the I.D., used to be made from ordinary Type 303. After changing to Carpenter, the manufacturer reports: "We find that Carpenter No. 8 (Type 303) gives us best true-machining quality since it is uniform throughout. Carpenter Stainless No. 8 is very important in holding down our unit production costs on this job."

THE CARPENTER STEEL COMPANY • 109 W. Bern Street • Reading, Pa.

Export Department: 233 Broadway, New York 7, N.Y. "CARSTEELCO"

more than corrosion resistance

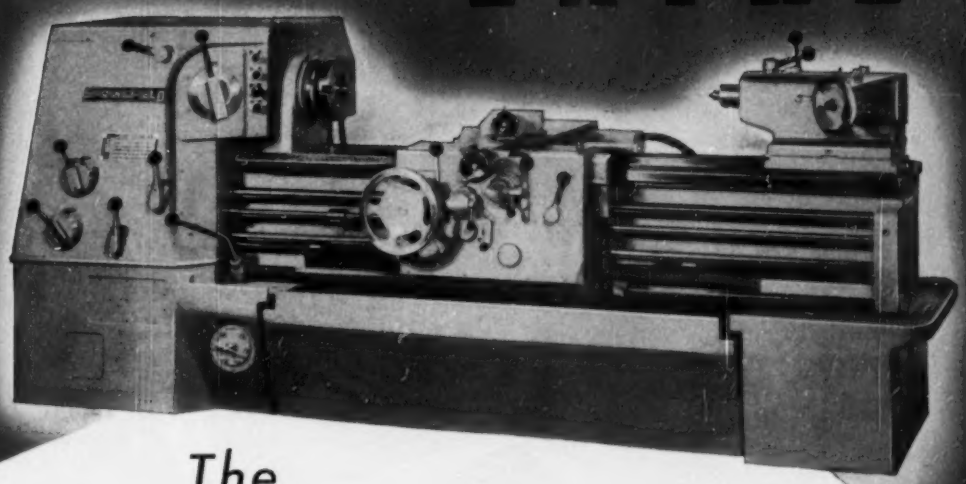
Carpenter

FREE-MACHINING

STAINLESS STEELS

WHEN YOU HAVE A STAINLESS PROBLEM—YOU CAN COUNT ON CARPENTER FOR THE ANSWER

New SPRINGFIELD Model S LATHE



The "World's Best Investment" in Lathes

NEW engineering designs give greater precision, rigidity and production capacity.

NEW control applications result in greater operating ease and efficiency.

NEW combinations of modern lubrication methods combat wear and reduce operating costs.

THE SPRINGFIELD MACHINE TOOL COMPANY

SPRINGFIELD, OHIO, U. S. A.

GENERAL DISTRIBUTORS: BRYANT MACHINERY & ENGINEERING COMPANY, 600 WEST MADISON ST., CHICAGO 6

Exclusive Representatives in All Principal Cities

NOW

ILLINOIS FINE PITCH HOBS

SEND FOR THIS FREE BOOK TODAY!

It's a complete discussion of fine pitch hobs, including data on types, tolerances, performance and practical shop procedures. And it explains an exclusive ILLINOIS Fine Pitch Hob feature that is certain to save money, too . . . the Toolgraph® Chart!

This electronically recorded "proof of accuracy" accompanies every ILLINOIS Fine Pitch Hob shipped. The need for costly reinspection is completely eliminated because you have an easy-to-read record of inspection already performed on specially developed machines.

See how you can produce superior fine pitch gears at lower cost with ILLINOIS Fine Pitch Hobs. Write for your copy today!

Illinois Tool Works, 2501 North Keeler Avenue, Chicago 39, Illinois.

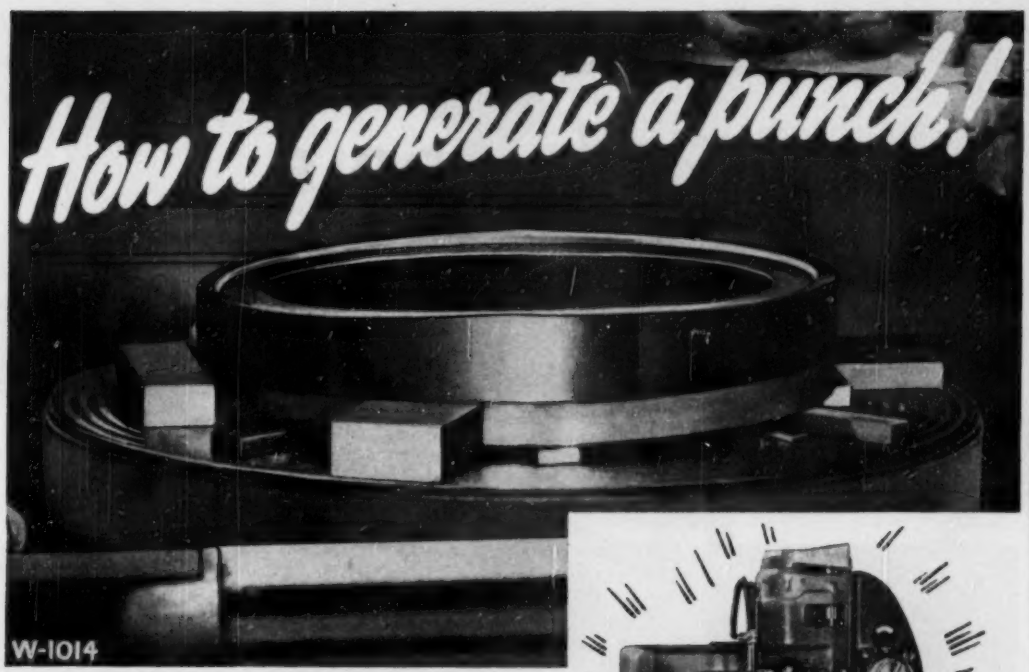
ILLINOIS
TOOL WORKS

HOBS SLITTING SAWS MILLING CUTTERS SHAPER CUTTERS BROACHES

HEADQUARTERS FOR ENGINEERED CUTTING TOOLS

T. M. Reg. U. S. Pat. Off.

How to generate a punch!



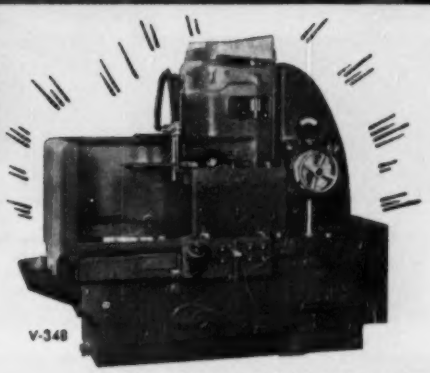
... Put it on the BLANCHARD

Obviously this is no ordinary surface grinding job—and obviously the Blanchard No. 18, with tilting wheelhead column, is the right machine for the job.

Duplicate circumferential and radial shear reliefs are generated in two set-ups on this 24 13/16" punch. Resharpening operation takes approximately 45 minutes.

Each portion is ground by the following method. The punch is centered on the magnetic chuck, and wedged to raise one side to obtain proper circumferential shear. The wheelhead is then tilted to a predetermined angle. A normal grinding operation generates the specified shape on one half of circle.

Blanchard is in a unique position to help you solve surface grinding problems that may look difficult or impossible —by methods that prove easy and profitable. Send samples or prints for free production estimates.



NO. 18 BLANCHARD SURFACE GRINDER

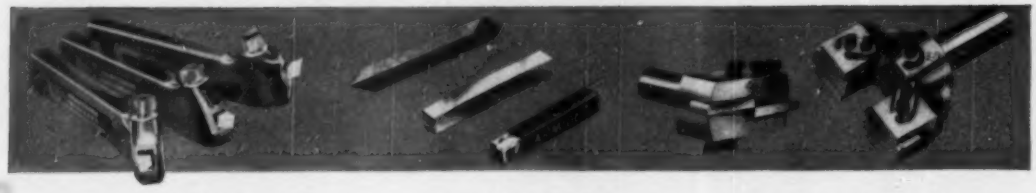
Send for free copies of "Work Done on the Blanchard," third edition, and "Art of Blanchard Surface Grinding."

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY
64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

ARMSTRONG

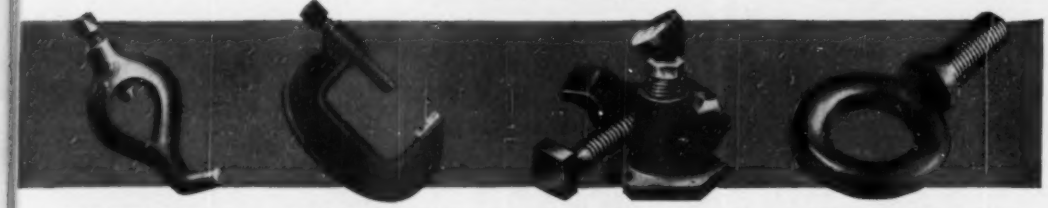
Quality TOOLS



ARMSTRONG TOOL HOLDERS
Permanent, multi-purpose tools, for every operation on Lathes, Planers, Slotters and Shapers.

ARMSTRONG HIGH SPEED
Ready-to-grind Bits...Ground Cutters.
ARMALOY Cast Alloy CUTTER-BITS
ARMIDE Carbide-Tipped CUTTERS
6 cutter shapes, 12 sizes—2 grades.

ARMSTRONG Turret Lathe and Screw Machine TOOL HOLDERS
Drill Holders, Cutter Holders, Finishing and Knurling Tools for standard operations.



ARMSTRONG Drop Forged DOGS
Lathe Dogs, Milling Machine Dogs, and Clamp Dogs. 12 types, all sizes.

ARMSTRONG Drop Forged "C" CLAMPS
Heavy Duty, Medium Service, Deep Throat, and Tool Makers' types in all sizes. Also Machinists' Clamps.

ARMSTRONG Setting Up Tools
A complete line of Drop Forged Strap Clamps, Planer and Bracing Jacks and T-slot Bolts.

ARMSTRONG Drop Forged Eye Bolts
Plain or shoulder pattern. Blank or Threaded. 14 sizes, Drop Forged and heat treated.

ARMSTRONG Ratchet Drills
All steel wearing parts hardened. Packer, Railroad, Standard, and Short types, both plain and reversible.

ARMSTRONG Drop Forged Wrenches
Both Carbon and Alloy Steel. Over 100 types in all sizes. Improved designs, steels, and heat treating ... stronger.

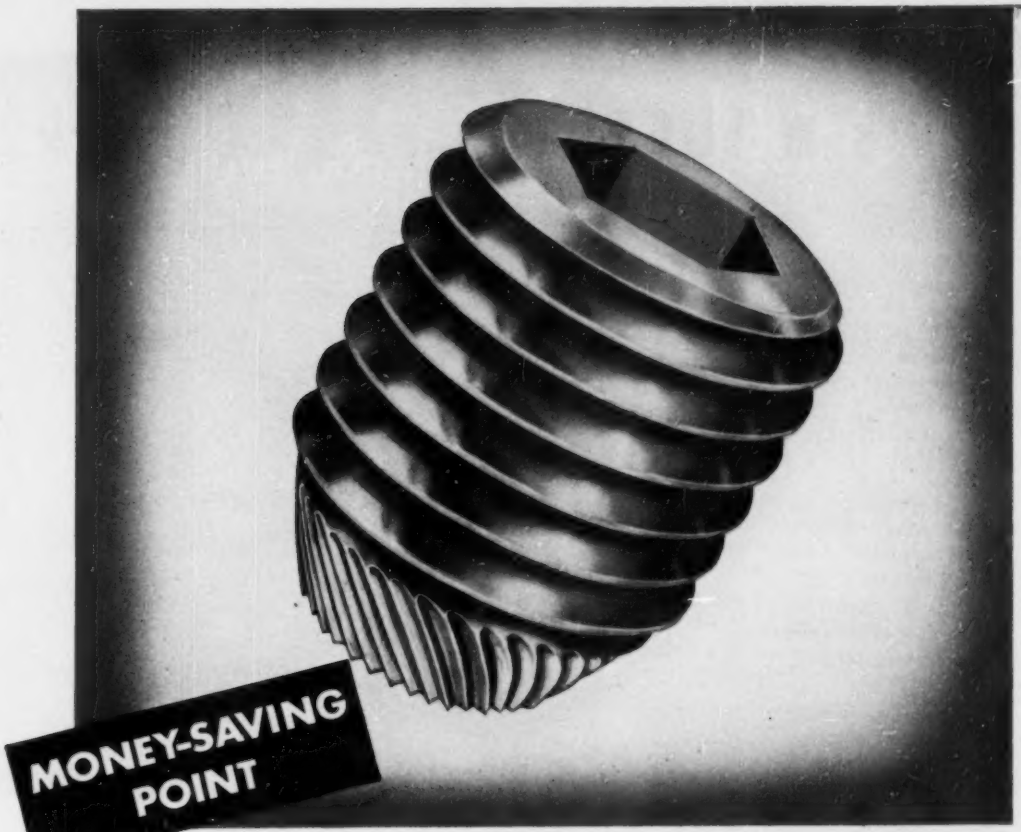
ARMSTRONG Detachable Socket Wrenches
All sizes and types with driving handles, extensions, and drop forged ratchets. Sold singly or in cased sets.

ARMSTRONG Machine Shop Specialties
Drill Drifts, Tool Posts, Drill Holders, Cutter Grinding Holders, and Tool Makers' Vises.

ARMSTRONG BROS.

Better Pipe Tools. A complete line, each a better tool with hardened, alloy or drop forged parts wherever they will add to strength or tool life.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5213 W. Armstrong Ave. Chicago 30, Ill.
Eastern Whse. and Sales: 199 Lafayette St., New York 12, New York
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.



Loosened set screws are a frequent cause of machine failure. When such failure occurs in important production machinery it can be expensive indeed—in downtime, repair costs, lowered production, poor deliveries and loss of customer good will.

Fortunately, the expense and headaches of this kind of machine failure can be eliminated by simply using UNBRAKO Self-Locking Set Screws, the only socket set screws with the famous "*money-saving*" knurled points.

The unique, counterclockwise knurls on the UNBRAKO point make the screw exceptionally vibration-resistant, prevent "creep" and subsequent loosening. The UNBRAKO "stays put", even under the most chattering vibration. IT WON'T SHAKE LOOSE!

Think of the advantages of such "Vibration Insurance" for *your* production machinery! And remember, it makes an impressive selling point when you use UNBRAKO Self-Locking Set Screws on your finished products.

Our folder 658 gives you further details. Write for your copy today.

SOCKET **UNBRAKO** SCREWS

SPS

STANDARD PRESSED STEEL CO.

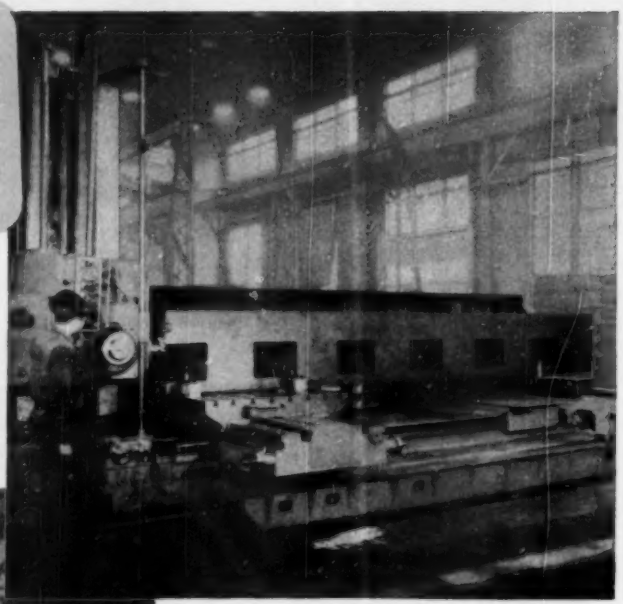
BOX 4 JENKINTOWN, PENNSYLVANIA

"UNBRAKO Counts With The Men Who Count"

Precision tool room jobs, of course, but . . . . .

How's a LUCAS on BIG work?

RIGHT — Lucas 5" spindle model with extra length bed, milling one end of the base casting for a large wire-drawing machine mounted on the main table and an auxiliary table. Notice, for example, how table overhang for long cross travel is supported by outer ways which are integral with the base casting.



BELOW — Lucas 5" spindle model boring the main (crankshaft) bearings of a 12 cylinder V-type Diesel Electric Locomotive crankcase.

Note the Electric Directional Control Pendant which can be swung and raised or lowered to the most convenient operating position.

These pictures tell the story. Lucas precision horizontal boring, drilling and milling machines are built big and heavy for heavy boring and milling operations on huge pieces.

The combination of high precision with great strength insures the accuracy required in jig and fixture work with the weight and strength for the heaviest duty, and makes a Lucas a true multi-purpose machine — usually the most used equipment in any shop.

Built in 3", 4", 5" and 6" spindle models, all available with Automatic Power Positioning which eliminates jigs and fixtures and makes the horizontal boring machine a highly accurate production tool. Work ranges from 36" x 36" to 96" x 132" standard. All sizes furnished with either two-way or four-way beds. Write for descriptive literature.

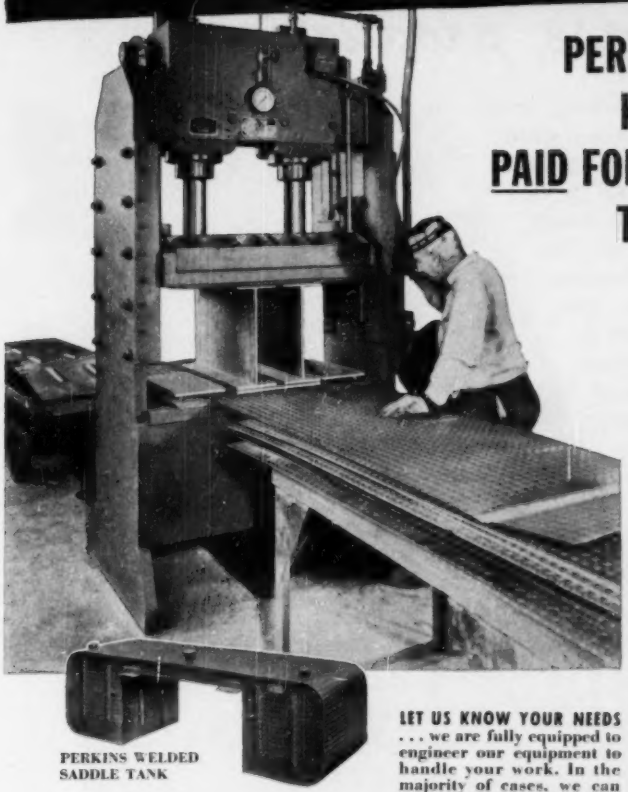
LUCAS OF CLEVELAND

LUCAS

Precision

HORIZONTAL BORING, DRILLING AND MILLING MACHINES
LUCAS MACHINE DIVISION, THE NEW BRITAIN MACHINE CO.
CLEVELAND 8, OHIO

"I wouldn't sell it for Twice what it Cost"



PERKINS WELDED SADDLE TANK

PERKINS WELDING SAYS KRW 100-TON PRESS PAID FOR ITSELF IN 60 DAYS THRU MATERIAL AND LABOR SAVINGS!

BIG TRAILER TRUCKS eat up a lot of gas on an average run. For that reason, most are equipped with big "saddle tanks" which hold 125 gallons or more... thus obviating frequent stops to fuel up. Perkins Welding makes these super tanks out of 1/8 inch steel. Until recently, they welded angle stiffeners onto the tanks for extra strength. A KRW Engineer showed them how they could save considerably by forming stiffening ribs on a KRW 100-Ton Press. The result... savings so great that "it paid for itself in 60 days."

"You don't need a sledge to drive a tack". For the same reason... on a big percentage of forming, planking and stamping work ... you don't need large, heavy-tonnage presses with their high initial and operating costs.

Production records, in a variety of industries, show that KRW Presses greatly reduce costs. First investment is very low, operating costs are still lower. In one instance the purchase price of a KRW Stamping Press was less than the foundation cost for heavier equipment.

KRW Presses are highly flexible... they can be built with platen sizes up to 36" x 60", and can be gap, open or closed end in type. Tonnage pressures can vary from 25 to 100-tons. Because they are hydraulically operated and not mechanically driven, they are quiet and vibrationless in operation. They are equipped with automatic safety and operational controls. Platens can be stopped at any point in their travel.

LET US KNOW YOUR NEEDS ... we are fully equipped to engineer our equipment to handle your work. In the majority of cases, we can make delivery in a fraction of the time required for other type presses. Let us hear from you.

ALL TYPES OF DIES. We are equipped to engineer and build dies to meet your specifications. All we need is available technical data, blue prints and, where practical, a sample piece of work. We'll quote prices and delivery date.

NAME YOUR NEEDS...WE'LL QUOTE PRICE AND QUICK-DELIVERY DATE...MAIL TODAY

K·R·WILSON

215 MAIN ST. · BUFFALO 3, N. Y.

11

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please quote me prices and information on following type KRW Presses. Please check. Gap ☐ Open End ☐ Closed End ☐

Tonnage Req..... Die Dimensions.....

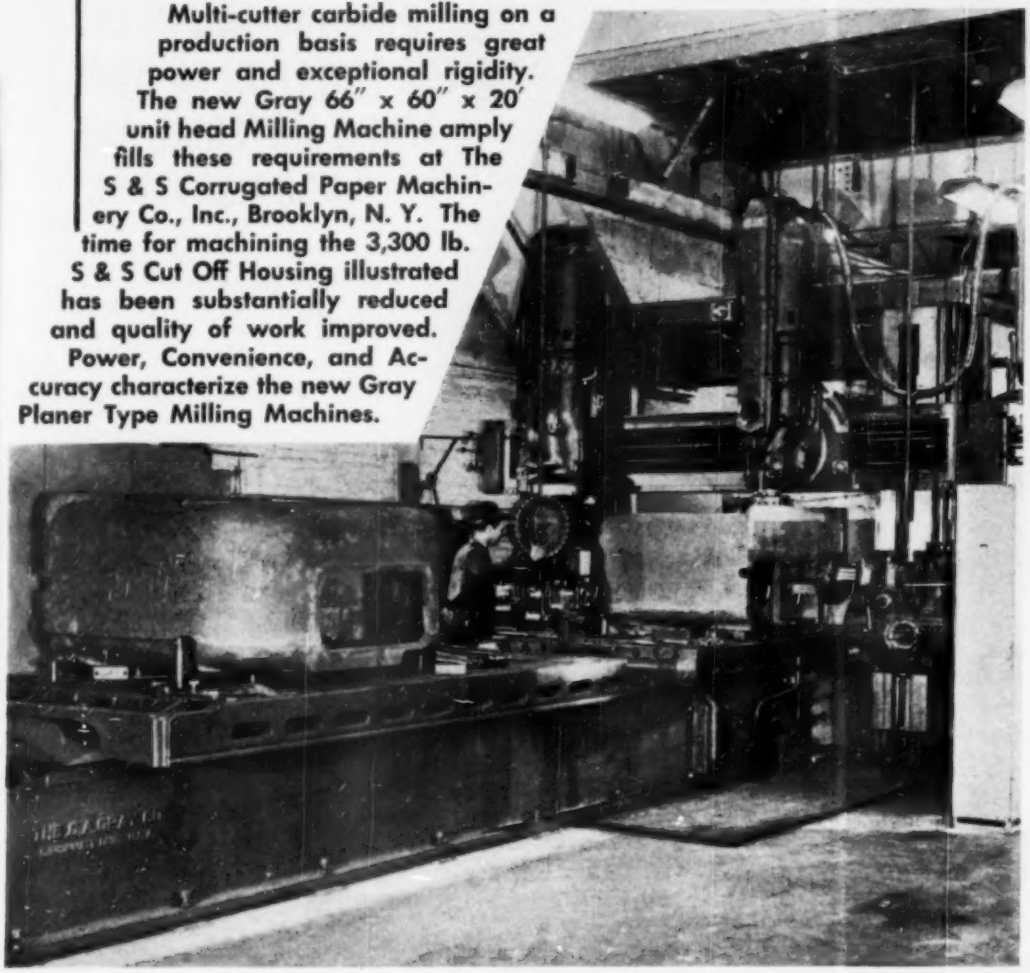
Name.....

Address.....

City and Zone..... State

THE GRAY WAY
to increase production

Multi-cutter carbide milling on a production basis requires great power and exceptional rigidity. The new Gray 66″ x 60″ x 20′ unit head Milling Machine amply fills these requirements at The S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N. Y. The time for machining the 3,300 lb. S & S Cut Off Housing illustrated has been substantially reduced and quality of work improved. Power, Convenience, and Accuracy characterize the new Gray Planer Type Milling Machines.



The G.A. **GRAY** *Company*

planers • milling planers
planer type milling machines
horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.
SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES

686
375
311

311 more pieces per grind!

CLE-FORGE HIGH SPEED DRILLS with crankshaft point give best results in exhaustive test

A few months ago an industrial plant ran a thorough test on a multiple spindle set-up drilling cast steel. The test was made for two purposes—(1) to learn what type of drill point was most satisfactory, and (2) to determine which drill gave best results. ◈ Before the test, the average number of pieces per grind was 375. The drills were pointed to a 90° included angle, and the flutes were thinned by hand. At the suggestion of a *Cleveland* Service Representative, the point was changed to the crankshaft type, ground by machine. The new point cut more freely, reducing end pressure on the spindles; and eliminated the human element in hand thinning the web. At the conclusion of the test, CLE-FORGE High Speed Drills were 'way out in front *with an average of 686 pieces per grind.*

◈ A *Cleveland* Service Representative will be glad to help solve *your* drilling problems. Contact our nearest Stockroom, or . . .

Telephone Your Industrial Supply Distributor

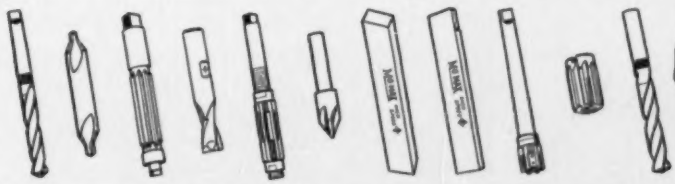
THE CLEVELAND TWIST DRILL CO.

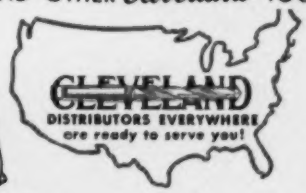
1242 East 49th Street • Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 11

E. P. Barrus, Ltd., London W. 3, England

ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS





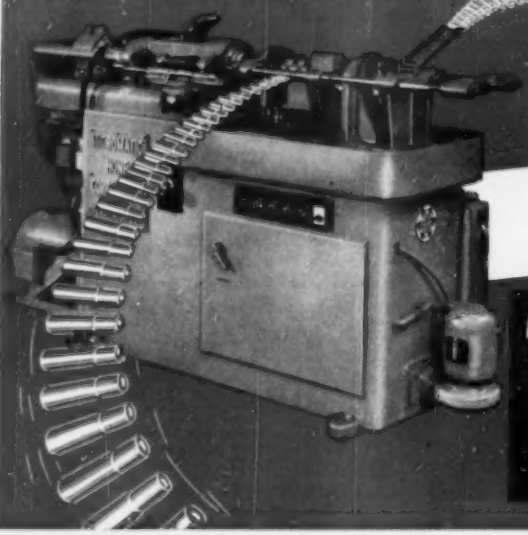
AUTOMATIC PRODUCTION

PRECISE TOLERANCES

MICROHONED CHARACTERIZED FINISH

Automatic loading and ejection of parts and automatic size control on these MICROMATIC Hydrohoner machines give increased production, reduced handling costs and improved quality.

WRITE FOR LITERATURE



DOUBLE SPINDLE MODEL 705-2 HYDROHONER
Automatic production over 400 gears per hour.

QUILL TYPE HORIZONTAL MODEL 523 HYDROHONER
Automatic production over 250 valve guides per hour.

MICROMATIC HONE CORPORATION
8100 Schoolcraft Avenue Detroit 4, Michigan

DISTRICT FIELD OFFICES
1323 S. Santa Fe, Los Angeles 21, California
616 Empire Bldg., 206 S. Main St., Rockford, Ill.
55 George St., Brantford, Ont., Canada
Micromold Manufacturing Div., Boston Post Road, Guilford, Conn.

They're here!

THE NEW 1950 LeBLOND HEAVY DUTY ENGINE LATHES

IN 12", 14", 16" AND 20" SIZES
WITH MORE SPEED AND GREATER POWER
HARDENED AND GROUND STEEL BED WAYS
TOTALLY ENCLOSED QUICK CHANGE BOX
INCREASED EASE OF OPERATION
TRADITIONAL LeBLOND LONG-LIFE ACCURACY

"THE MOST MODERN LATHES on the market today!" That's what leading buyers are saying about the new 1950 LeBlond heavy duty engine lathes. They're beautiful in appearance. They're outstanding in the way they remove stock: quickly, easily and economically. They'll be the most useful lathes in your plant because they'll perform a wider variety of work. If you're looking for further reduction of your metal turning costs, you'll welcome the new LeBlond heavy duties. There's a size for every requirement.

	12"	14"	16"	20"
Swing over bed and carriage wings	14½"	16½"	20½"	22½"
Spindle speeds, number	12 or 24	12 or 24	12 or 24	16 or 32
Spindle speeds, range, rpm	25-1250	25-1250	16-1010	9-800
Feed and thread changes	60	60	60	60
Feeds, range	.002"-.126"	.002"-.126"	.0027"-.152"	.004"-.250"
Threads per inch range	2-120	2-120	1-60	1-60
Motor recommended	7½ hp	7½ hp	10 or 15 hp	15 or 20 hp

Send today for descriptive bulletins.

THE R. K. LeBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO, U.S.A.
LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES
SALES OFFICES: New York, Chicago, Detroit.

LeBLOND

Only MARVEL *builds all four**

While it is true there are several builders of hack sawing machines and many builders of band sawing machines, only MARVEL builds *BOTH* hack saws and band saws. The fact is that MARVEL manufactures 35 models of 10 basic types of metal sawing machines which include the world's fastest automatic production saw, the world's largest giant hydraulic hack saws, the world's most versatile band saw and the most widely used small shop saws.

With intimate and broad field experience in all types of metal cutting-off equipment and 35 different saws available, it is obvious that MARVEL Field Engineers occupy a unique and exclusive position in the industry. They are eminently qualified to make expert and *unbiased* recommendations covering the type, size and model of metal sawing equipment best suited to individual requirements—the most efficient, most accurate, fastest, broadest in scope and the most economical.

MARVEL is also the only manufacturer of both metal sawing *machines* and metal sawing *blades*. Because the efficiencies of both the machine and the blades are interdependent, each upon the capability of the other, expert knowledge covering both saws and saw blades is essential to the proper appraisal of any specific sawing situation. Correct balance of cutting speed and blade life, feed pressure and blade tension are all potent factors in over-all performance. Here again it is the MARVEL Field Engineer who is qualified to provide the comprehensive answer to your question. His job is to help you saw metal most efficiently—his services are available upon request—gratis.

Write for Catalog 49

***HACK SAWING MACHINES**

***BAND SAWING MACHINES**

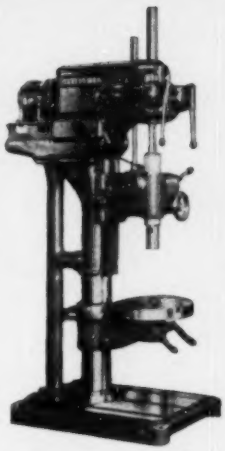
***BAND SAW BLADES**

***HACK SAW BLADES**

ARMSTRONG-BLUM MFG. CO.
BLOOMINGDALE AVE., CHICAGO 39, U.S.A.

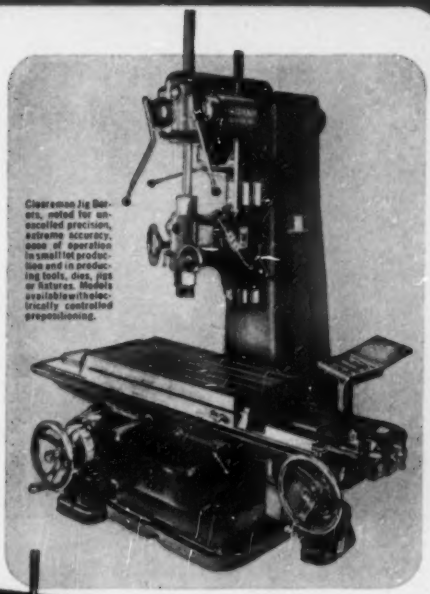
THE CLEEREMAN LINE

OF PRECISION JIG BORERS and DRILLING MACHINES

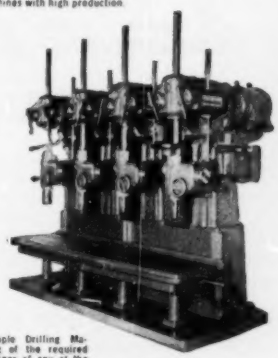


Cleereman Round Column Drilling Machines produce accurate holes at high speed and at low cost and are general purpose machines with high production.

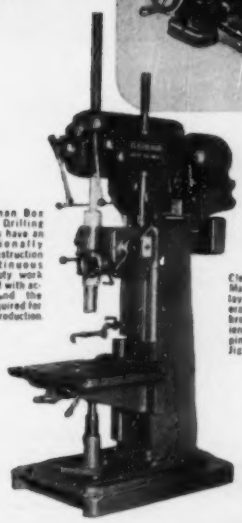
Cleereman Model 325 Single Unit Sliding Head Drilling Machines combine extreme sensitivity with rugged construction, are extremely versatile and may be used for production drilling and tapping.



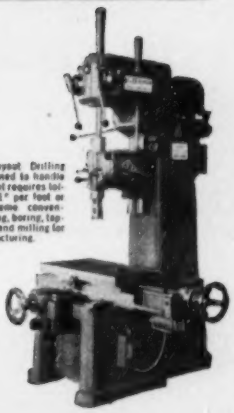
Cleereman Jig Borers, noted for unexcelled precision, extreme accuracy, ease of operation in small lot production and in producing tools, dies, jigs or fixtures. Models available with electrically controlled prepositioning.



Cleereman Multiple Drilling Machines consisting of the required number of machines of any of the three types supplied to meet individual requirements.



Cleereman Box Column Drilling Machines have an exceptionally rigid construction for continuous heavy duty work combined with accuracy and the speed required for low cost production.



Cleereman Layout Drilling Machine designed to handle layout work that requires tolerances of .001" per foot or broader. Extreme convenience for drilling, boring, tapping, reaming and milling for jigless manufacturing.

BRYANT Machinery & Engineering Company

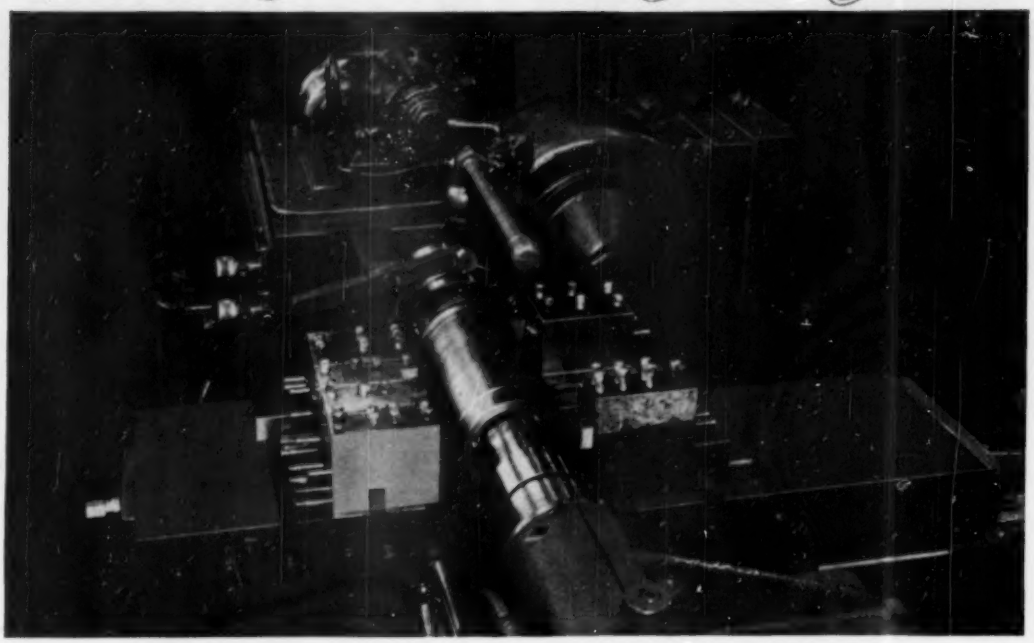
General Office
400 West Madison Street, Chicago 6
Representatives in Principal Cities

Affiliated with—

CLEEREMAN MACHINE TOOL CO. Green Bay, Wis.

BUILDERS OF PRECISION JIG BORERS & DRILLING MACHINES

CYLINDER LINERS:



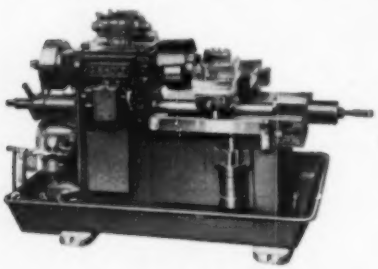
17 different sizes on One Automatic Lathe

THE GISHOLT No. 12 HYDRAULIC

You wouldn't expect an automatic lathe to handle such a wide variety of work as this—unless you know the Gisholt No. 12 Hydraulic.

This versatile automatic lathe handles 17 different sizes of cylinder liners ranging from 6½" to 13" in length and from 3" to 5" in diameter. The work is chucked on expanding arbors with interchangeable pads, while the front and rear tooling is mounted in standard, interchangeable tool blocks. This arrangement provides exceptional flexibility and a facility to quickly change over from one job to another.

When you can handle as many different sizes of parts on *one* automatic lathe—and cut both machining and set-up time—you're *bound* to cut your costs.



GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

Gisholt No. 12 Hydraulic Automatic Lathe—a rugged 12" lathe that combines speed and accuracy with easy set-up — unique among automatics.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

NOW . . .

Write for

Bulletin 49-55

This new bulletin has 28 pages of useful hydraulic cylinder information such as installation data, design features, technical data, etc.

Vickers now offers a very extensive line of oil hydraulic cylinders . . . cylinders that have important improvements. Vickers Cylinders are of modern design . . . as advanced as the Vickers Pumps and Controls with which they will be used to provide better hydraulic systems. There are 12 standard bore sizes ranging from 1" to 8", and 12 standard mountings with innumerable combinations. For complete information, ask for Bulletin 49-55.

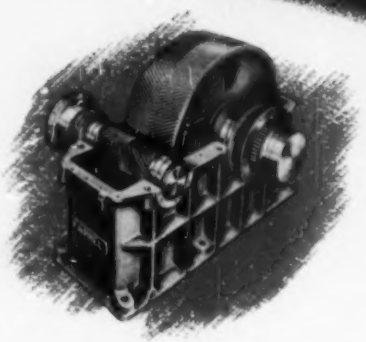
VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1410 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: ATLANTA • CHICAGO • CINCINNATI CLEVELAND • DETROIT • HOUSTON • LOS ANGELES (Metropolitan) • MILWAUKEE NEW YORK (Metropolitan) • PHILADELPHIA • PITTSBURGH • ROCHESTER ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



On page 5 of Farrel's latest bulletin on speed reducers, you will find a description of the *Gear with a Backbone* —the type of gear used in Farrel gear units.

The *backbone*, formed where the helices meet, makes the teeth continuous across the gear, providing extra strength and greater load-carrying and shock capacity —especially important in heavy-duty speed reducers. Precision generation by the famous Farrel-Sykes method assures accuracy of tooth spacing, tooth contour and helix angle, which pay off in smooth, quiet, uniform operation.

In addition to describing the gears, this bulletin also contains specifications, horsepower rating tables, overhung load capacities, dimensions and weights of single, double and triple reduction units.

If you buy or specify speed reducers, you should have a copy of this informative manual. Fill out the coupon and mail it today. FB-562

FARREL-BIRMINGHAM CO., INC., 344 Vulcan St., Buffalo 7, N.Y.

Plants: Ansonia and Derby, Conn., Buffalo, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Cleveland, Detroit, Chicago, Los Angeles, Tulsa, Houston

Farrel-Birmingham®

FARREL-BIRMINGHAM COMPANY, INC. AM
344 VULCAN STREET, BUFFALO 7, N. Y.

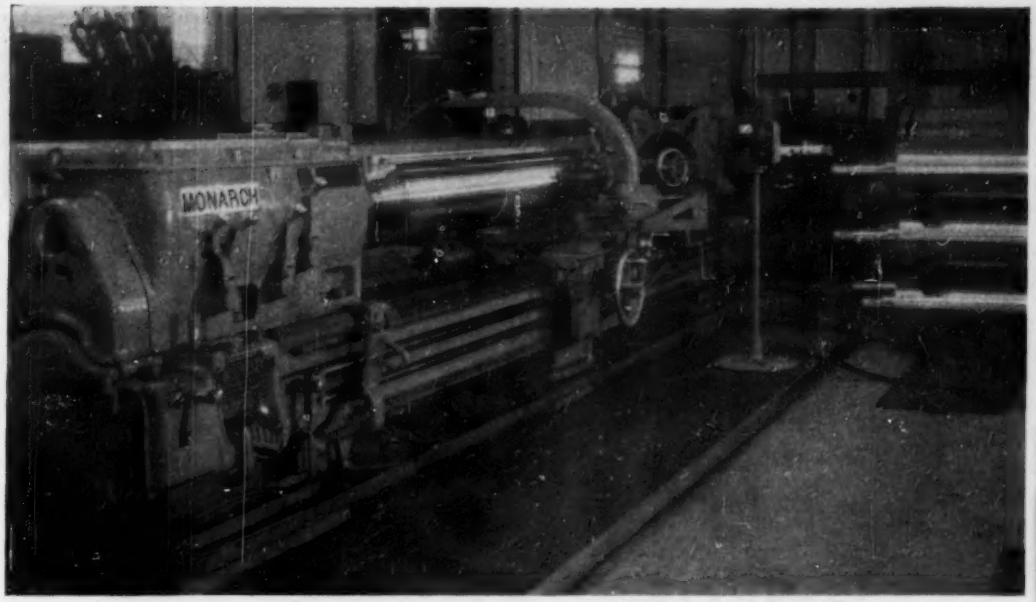
Please send me, without cost or obligation, a copy of Bulletin 449, "Farrel Speed Reducers."

Name ..... Title .....

Company .....

Address .....

City ..... State .....



TURNING TIME REDUCED 80%

Printing Press Rolls Machined in 1½ Hrs. Instead of 7½

One fifth of former time! That's the kind of "*peak production at a profit*" you can expect with Monarch's Air-Gage Tracer-controlled lathes.

But peak production is only part of the story. Accuracy is spelled out with a capital "A". On this job, for example, necks and body of the roll are turned complete, and shoulder spacing on the ends of the roll —88½" apart—is held to + .001" – .000"!

The combination of air-gage accuracy with Packaged Controls and carbide tools permits exact duplication of parts in floor-to-floor times that are second to none.

You can't beat the Air-Gage Tracer's low production costs, either. Single-point turning means lower tool costs, faster set-up times, less machine overhead. And lot size is no limitation: you can trace from a round or a flat template—whether you're turning out two or two thousand parts.

This duplication principle is ideally applicable for stepshafts, contours and taper turning or boring. It brings the speed of automatic lathe operation within reach of every production job. May we show you how it can cut costs in your shop?

JOB FACTS

Part: Printing Press Roll

Material: SAE 1045 Forging

Size: 107" x 14" Diam.

Machine: Monarch 25 x 144 Model N Engine Lathe equipped with Air-Gage Tracer and Packaged Controls

Tooling: Carbide Tipped

Operations: Turn Necks and Body complete

Tolerance: + .001" – .000" between Shoulders

Former Time: 7½ Hours

Monarch Time: 1½ Hours

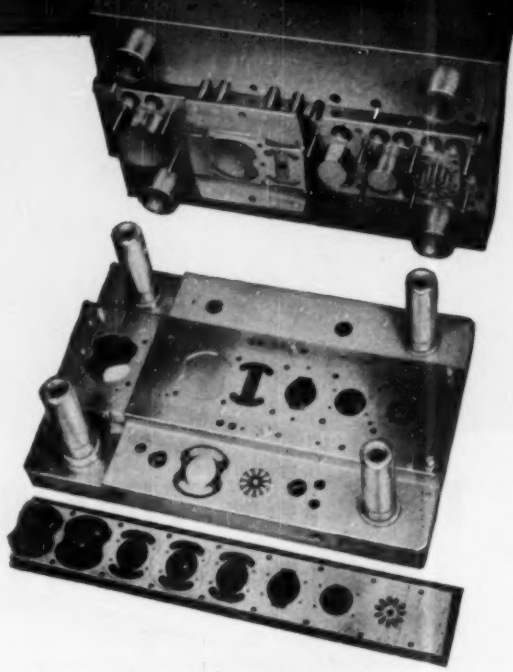
ACCURACY · ECONOMY · LONG LIFE

Monarch TURNING MACHINES

THE MONARCH MACHINE TOOL CO. • SIDNEY, OHIO

FOR A GOOD TURN *FASTER* – TURN TO MONARCH

MEEHANITE® Die Shoes are TOUGH, ACCURATE, DEPENDABLE



BLANKING DIES, like those illustrated, are expensive precision tools—literally, in many cases, "worth their weight in gold." The Cleveland Form Tool Company, Cleveland, Ohio, specify Meehanite castings for such units. The die shown takes a 42-ton blow at 160 strokes per minute and can produce 5 million blanks before replacement.

Meehanite castings are manufactured under processes which permit accurate structural control of the metal, and thus the dependable achievement of the required properties for the job. They provide:

1. High Compressive Strength.
2. Adequate Shock and Vibration Absorption.
3. Dimensional accuracy under impact.
4. Freedom from "after-machining" distortion.
5. Density—Uniformity—Machinability.

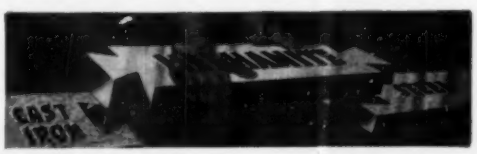
Build "QUALITY" into your product with Meehanite Castings.

We have a Bulletin 28 entitled "7 Questions and Answers About Meehanite Castings" and if you would like a copy write to any of the foundries listed.

MEEHANITE FOUNDRIES

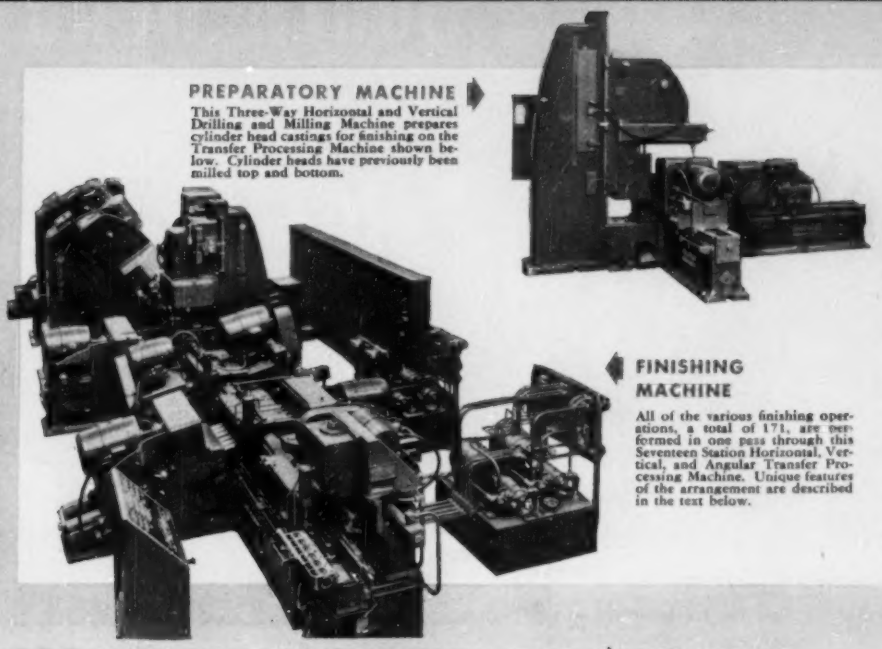
American Brake Shoe Co.	Mahwah, N. J.
The American Laundry Machinery Co.	Rochester, N. Y.
Atlas Foundry Co.	Detroit, Mich.
Banner Iron Works	St. Louis, Mo.
Barnett Foundry & Machine Co.	Irvington, N. J.
E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry Inc.	Providence, R. I.
E. Long Ltd.	Orillia, Ont.
H. W. Butterworth & Sons Co.	Bethayres, Pa
Continental Gin Co.	Birmingham, Ala.
The Cooper-Bessemer Corp.	Mt. Vernon, O. and Grove City, Pa.
Crawford & Doherty Foundry Co.	Portland, Ore.
Farrel-Birmingham Co., Inc.	Ansonia, Conn.
Florence Pipe Foundry & Machine Co.	Florence, N. J.
Fulton Foundry & Machine Co., Inc.	Cleveland, O.
General Foundry & Manufacturing Co.	Flint, Mich.
Gruenles Foundry Co.	Chicago, Ill.
The Hamilton Foundry & Machine Co.	Hamilton, O.
The Henry Perkins Co.	Bridgewater, Mass.
Johnstown Foundries, Inc.	Grove City, Pa.
Kanawha Manufacturing Co.	Charleston, W. Va.
Koehring Co.	Milwaukee, Wis.
Lincoln Foundry Corp.	Los Angeles, Calif.
Otis-Fensom Elevator Co., Ltd.	Hamilton, Ont.
Pohlman Foundry Co., Inc.	Buffalo, N. Y.
The Prescott Co.	Menominee, Mich.
Ruendale Foundry & Machine Co.	Pittsburgh, Pa.
Russ-Meehan Foundries	Chattanooga, Tenn.
Shenango-Penn Mold Co.	Dover, O.
Smith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Mass.
The Stearns-Roger Manufacturing Co.	Denver, Col.
Traylor Engineering & Mfg. Co.	Allentown, Pa.
Valley Iron Works, Inc.	St. Paul, Minn.
Vulcan Foundry Co.	Oakland, Calif.
Warren Foundry & Pipe Corp.	Phillipsburg, N. J.

"This advertisement sponsored by foundries listed above."



NEW ROCHELLE, N. Y.

GREENLEE



PREPARATORY MACHINE

This Three-Way Horizontal and Vertical Drilling and Milling Machine prepares cylinder head castings for finishing on the Transfer Processing Machine shown below. Cylinder heads have previously been milled top and bottom.

FINISHING MACHINE

All of the various finishing operations, a total of 171, are performed in one pass through this Seventeen Station Horizontal, Vertical, and Angular Transfer Processing Machine. Unique features of the arrangement are described in the text below.

179 OPERATIONS EVERY 80 SECONDS ON NASH CYLINDER HEADS

MILLING • DRILLING • BORING • COMBINATION BORING AND CHAMFERING • TAPPING

Beginning over a decade ago, Greenlee has done much pioneering work in the development of the now widely-used transfer process type of high-production machine tool. The recent examples shown above, of Greenlee design and manufacture, include a number of interesting features.

These two companion machines are located at Nash Motors, Kenosha, Wisconsin, where they are used to transform the faced head castings for a six-cylinder engine into finished pieces ready for the engine assembly line. This involves performing a total of 179 operations of various types.

The first machine simultaneously bores 3 exhaust pipe mounting pads, drills 4 holes, mills a 4-inch diameter boss, and drills and reams the dowel holes which will locate the piece accurately at the various stations on the transfer machine. A total of 8 operations are performed, not counting the dowel holes.

The transfer machine automatically takes the piece through a series of 17 stations, in the course of which it receives 9 milling, 81 drilling, 42 boring and combination boring and chamfering, and 39 tapping operations — a total of 171. The cycle time per transfer is 80 seconds. One of the interesting features of the big machine is the single-spindle milling head located at station 2, which mills a pad the full length of the head. This spindle traverses the length of the piece clamped in the station, then returns to starting position as the next piece indexes into place.

Combustion chambers are milled with a traversing six-spindle head at station 6. The spring seats are milled at the same time with a traversing two-spindle head on the opposite side of station 6.

All of the specially-designed heads are mounted on standardized Greenlee self-contained hydraulic units, and hydraulic clamping and unclamping insures accurate positioning and maximum rigidity for the machining operations.

It is interesting to note that the hydraulic valves, pumps, and controls — three stands of them — are openly mounted instead of being concealed inside a base casting or under a cover. This was done at Nash's request, to provide maximum accessibility for servicing.

The machine is completely interlocked and actuated electrically, with a central control panel, in accordance with best modern practice. A bank of signal lamps indicates all station operations including malfunctions.

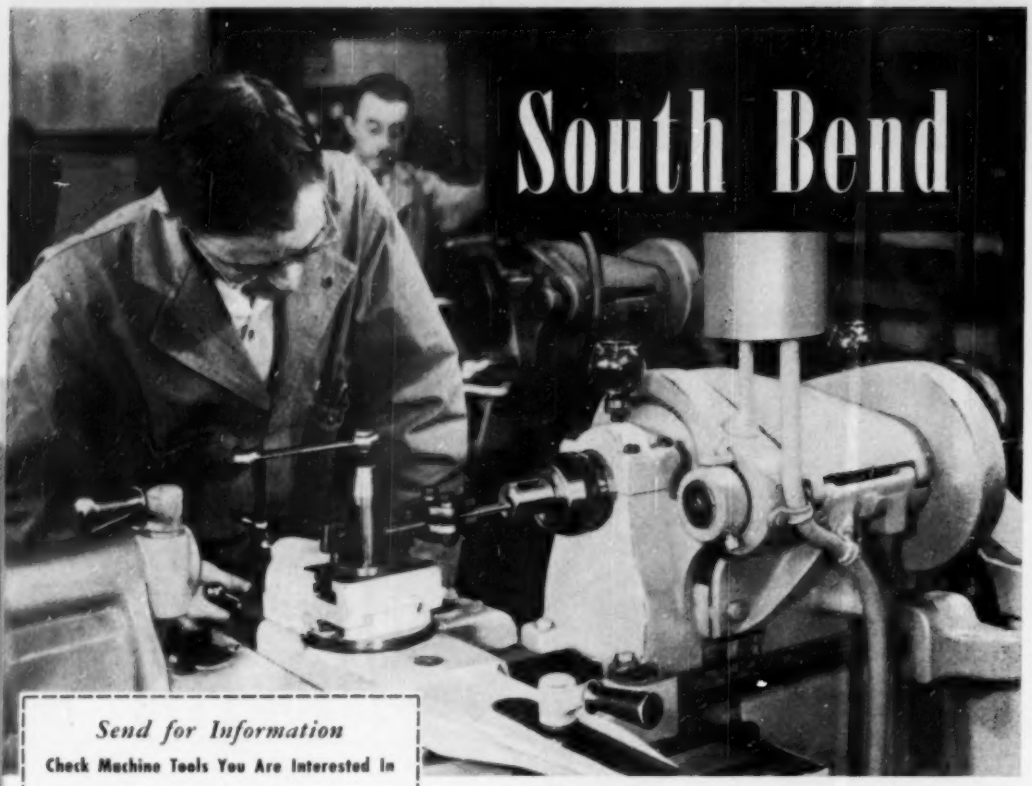
While this machine is typical of Greenlee achievement in its type, it is not indicative of the full scope of Greenlee facilities. There are many other Greenlee machines made, both larger and smaller, to fill important production requirements accurately and efficiently. We suggest a discussion with your Greenlee representative regarding your particular needs.

PRODUCTION MACHINERY

GREENLEE

GREENLEE BROS. & CO.
1721 MASON AVE., ROCKFORD, ILL.

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES



14-1/2" x 5', 1" collet, Toolroom Lathe with 1-1/2 h.p., 3 phase, 60 cycle, 220 volt motor and switch; f. o. b. factory **$1466.25**

Time Payments — $367.25 down, $97.07 for 12 months.

Precision Tolerances Easy

Because it is easy to machine work to the most exacting specifications with South Bend Lathes, they were selected by one of the largest steel manufacturers for use in their research laboratory shown in the illustration above. Here special tools, dies, fixtures and parts are machined to specified dimensions with ease and certainty.

Often the accuracy and quality of finish obtained with South Bend Lathes are such that subsequent grinding, honing, or lapping operations are unnecessary. Equally adaptable to toolroom, manufacturing, or maintenance operations, South Bend Lathes will give you years of satisfactory service for a minimum cost.

Send for Information

Check Machine Tools You Are Interested In

- ☐ 14-1/2" PRECISION LATHES
- ☐ BENCH LATHES 9" and 10"
- ☐ TURRET LATHES 1/2" and 1" collets
- ☐ 7" BENCH SHAPERS
- ☐ 14" DRILL PRESSES
- ☐ 10", 13", 16", 16/24" PRECISION LATHES
- ☐ LATHE TOOLS AND ATTACHMENTS
- ☐ TIME PAYMENT PLAN

Name_____

Street_____

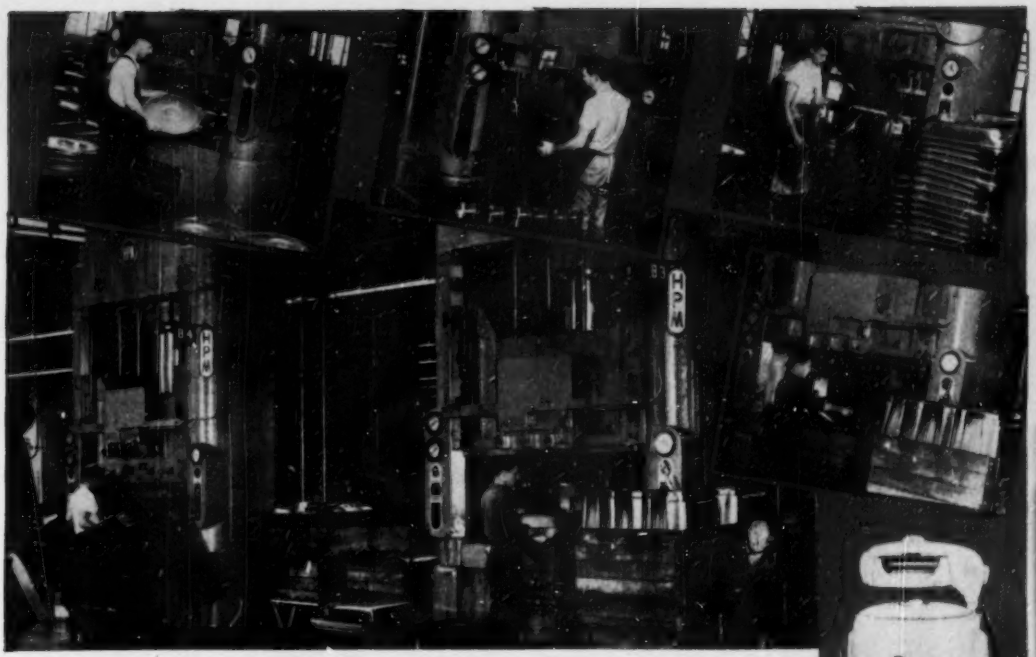
City_____ Zone_____

State_____

Building Better Tools Since 1906

SOUTH BEND LATHE

SOUTH BEND, INDIANA



H-P-M HYDRAULICS

Do the Drawing Operations

AT "1900's" NEW STAMPING PLANT!

Two H-P-M hydraulic presses installed twelve years ago proved to Nineteen Hundred's production men that H-P-Ms are the answer to deep drawing. As a result . . . when 1900 established its new stamping plant, seven more H-P-Ms were put to work!

These nine presses are drawing Kenmore & Whirlpool washing machine, ironer and dryer parts with exceptional cost saving results . . . in some cases, complete operations have been eliminated . . . down time has definitely been reduced and scrap loss has been kept to an absolute minimum. All this, plus better quality control, has been 1900's experience with H-P-Ms. Investigate what they will do for you. *Write today.*

THE HYDRAULIC PRESS MFG. COMPANY

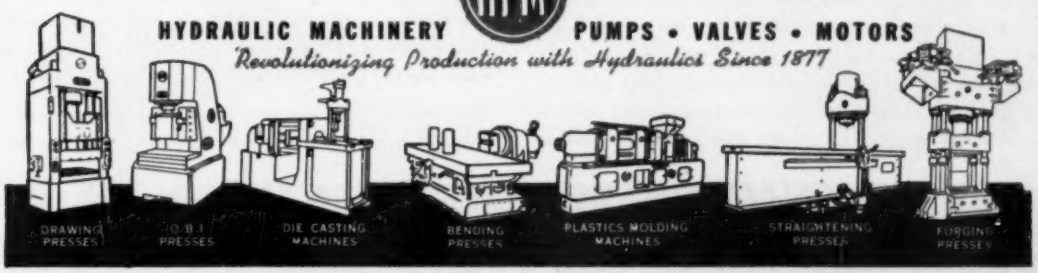
1002 Marion Road — Mount Gilead, Ohio, U.S.A.

Write for a copy of the story about 1900's new stamping plant which recently appeared in "Production Engineering & Management" magazine.

HPM

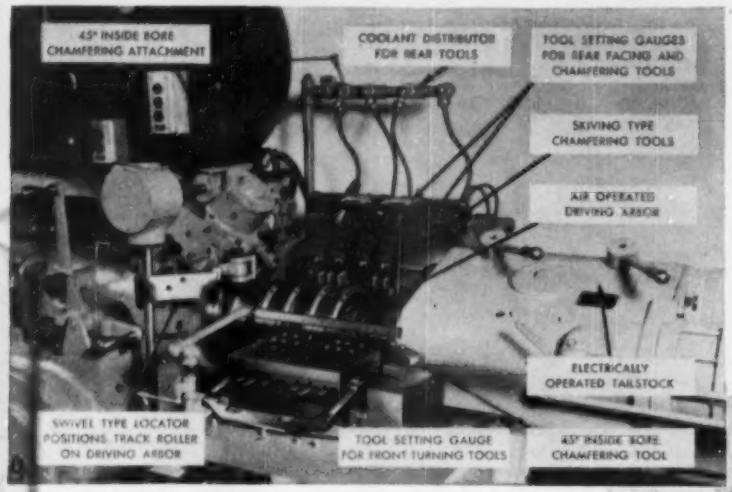
HYDRAULIC MACHINERY — PUMPS • VALVES • MOTORS

Revolutionizing Production with Hydraulics Since 1877



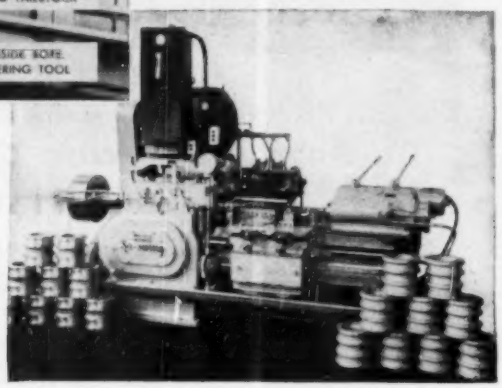
MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. **"THE Lo-swing PEOPLE"** SENECA FALLS, NEW YORK


45° INSIDE BORE CHAMFERING ATTACHMENT
COOLANT DISTRIBUTOR FOR REAR TOOLS
TOOL SETTING GAUGES FOR REAR FACING AND CHAMFERING TOOLS
SKIVING TYPE CHAMFERING TOOLS
AIR OPERATED DRIVING ARBOR
ELECTRICALLY OPERATED TAILSTOCK
SWIVEL TYPE LOCATOR POSITIONS TRACK ROLLER ON DRIVING ARBOR
TOOL SETTING GAUGE FOR FRONT TURNING TOOLS
45° INSIDE BORE CHAMFERING TOOL

Close-up view of tooling.

Overall view of machine showing rough and finished work.



MODEL R-14 Lo-swing Lathe Cuts Machining Time on Track Rollers

Problem: **To automatically turn, face and chamfer Track Rollers in one operation.**

Solution: **The Model R-14 Automatic Lo-swing Lathe was selected for this job due to its rigid construction and its demonstrated fine performance with cemented carbide tools. The Track Rollers, 9-3/4" in diameter and 9-3/8" long, are held and driven from the rough forged bore with a compensating type, six jaw air operated driver. The tailstock, shown in the withdrawn position in the lower illustration, is electrically operated and has a travel of 16" to facilitate loading and unloading of the rollers on the driver. The upper illustration shows the tooling which consists of six front turning tools, eight heavy rear facing tools, eight small chamfering tools and two chamfering tools for the inside diameter. Note the special cam operated, 45° inside bore chamfering attachment mounted on the headstock of the lathe. Swivel type tool-setting gauges, mounted directly on the tool blocks, reduce tool-setting time. All tools are cemented tungsten carbide operating at cutting speed of 350 ft. per minute. Total floor to floor time for the job is 3.5 minutes each.**

Engineered jobs are our specialty, and our staff is at your disposal to assist in solving your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

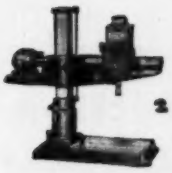
PRODUCTION COSTS ARE LOWER WITH Lo-swing

Which SUPER SERVICE will suit your JOB?

For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs more efficiently. Our engineers will help you select the proper machine for your work, or if you prefer, send for any or all of the bulletins pertaining to the machines that interest you.

1

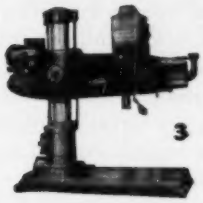
1. The smallest SUPER SERVICE Radial Drill manufactured by The Cincinnati Bickford Tool Company, as described in Bulletin R-26A, has a 7½" diameter column and a 2½' arm length. This machine is furnished with 6 speeds and 3 feeds and a 1 HP driving motor.


2

2. The 9" Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21B, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.

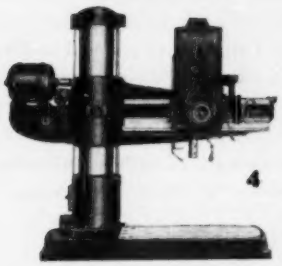
3. SUPER SERVICE Radial with 11" dia. column is described in Bulletin R-29. Built with a 3', 4' or 5' arm. 12 speeds and 6 feeds or 36 speeds and 18 feeds furnished. Powered with either a 5 or 7½ HP driving motor.

4. The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 11 different standard sizes, ranging from 4' to 8' arm lengths and 13" to 19" diameter columns. These machines are furnished with 7½ to 20 HP driving motors.


3

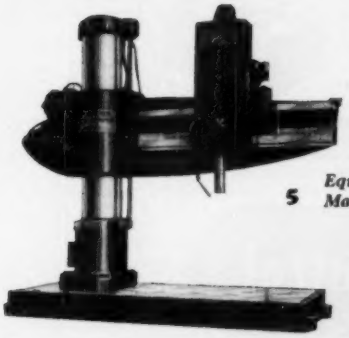
5. The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.

6. The SUPER SERVICE Portable Horizontal Drilling Machine with 6 speeds and 1½ HP driving motor is more fully described in Bulletin HR.


4

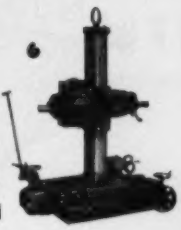
7. The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.

8. The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.


5

9. The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 9 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.

10. The SUPER SERVICE Jig Boring Machine, as described in Bulletin U-26B, is furnished in 12 speeds and 9 feeds with a 3 HP driving motor.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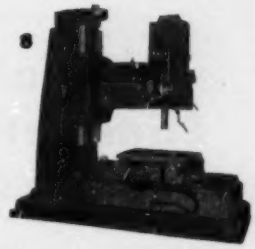
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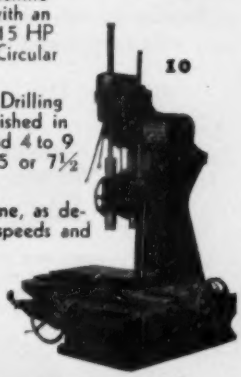
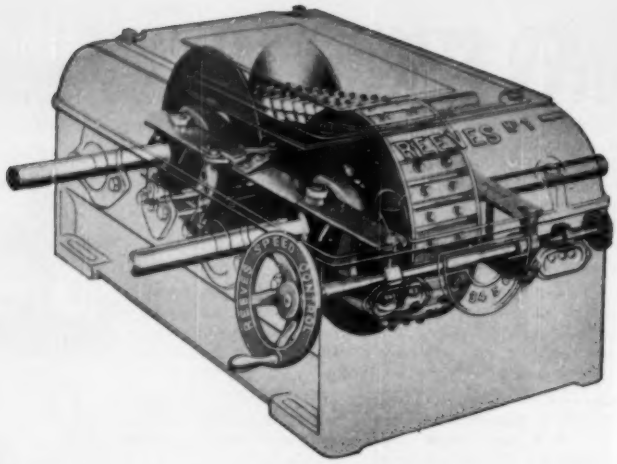

10

Equal Efficiency of Every Unit Makes the Balanced Machine

SUPER SERVICE

THE CINCINNATI BICKFORD TOOL CO.

Oakley, Cincinnati 9, Ohio, U.S.A.



Accurate, Variable Speed Control Eliminates Guesswork in Production

The "missionary" work for variable speed control has been done. On every hand, in every industry where operating conditions are subject to change, there is abundant evidence to support its claims for increased output, improved, uniform quality and reduced cost.

Your problem, then, is one of selection . . . of determining which type and make of variable speed drive is best for your particular need. In making that choice, consider these facts about infinite, stepless REEVES Speed Control:

Manufactured by a company with more than fifty years' specialized experience in this specialized field. Design based on a proved operating principle. Ruggedly constructed for trouble-free operation and easy maintenance without special training or tools. Offered in a complete range of sizes, capacities and speed ratios, and furnished with any type of control . . . easily incorporated in new machine designs or applied to existing machines. Performance-proved in 260,000 installations and provided as standard equipment in 2,100 different makes of machines. Backed by a nation-wide engineering and service organization.

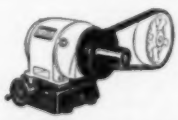
Think it over . . . this broad background of experience, this documented evidence of efficiency on any and all jobs . . . and we believe you will understand why REEVES is Industry's approved—*and proved*—method of variable speed control. Write for new REEVES Speed Control Catalog No. A28-3N.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

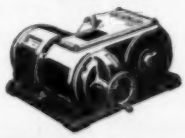
Recognized Leader in the Specialized Field of Speed Control Engineering

THE THREE BASIC REEVES SPEED CONTROL UNITS

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over a wide range—2:1 to 16:1. Sizes—fractional to 87 hp.



VARI-SPEED MOTOR PULLEY converts any standard constant speed motor to a variable speed drive within 4:1 ratio. Sizes to 10 hp.



MOTODRIVE combines motor, speed varying mechanism and reduction gears in single compact unit. Speed variations 2:1 to 6:1 inclusive. Sizes to 20 hp.

Accurate Variable

REEVES Speed Control

Gives the Right Speed for Every Job!

SPOT NEWS OF METALWORKING

Milling steel dry at 1435 sfpm has been done on an experimental basis, using the rapid-traverse mechanism to achieve 150-ipm feed. A 6-in., 8-tooth carbide-tipped cutter was used.

A prominent diesel builder has spent $1 million a year on new plant equipment each of the past five years, 80% of it for machinery and tooling. Expenditures in 1950 will be up 25 to 30%. As a result, 56% of the company's equipment is less than five years old, only 18% over 10 years old.

Four New England companies are using carbides 100% for their machining operations in an effort to cut production costs so that they can compete against adverse freight rates on materials.

Two high-strength magnesium alloy systems, the Mg-Zn-Zr system and the Mg-Al-An-Mn system, are under study by contractor for the Air Force. Compressive and tensile yield strengths are in excess of 40,000 psi, with ultimate strengths more than 50,000 psi. Reports also indicate development of a feasible method of atomizing magnesium alloys, and of extrusion of powder without surface blistering.

One New England company is setting up to make its own tungsten-carbide for header dies. Grades required are softer than needed for cutting tools. Reason for the move is to avoid delays in getting carbide nibs used.

A machine for measurement of wear on metal surfaces, developed by the Naval Engineering Experiment Station at Annapolis, has shown itself to be accurate within 0.00005 in. in measuring wear on chromium-plated diesel cylinder liner surfaces. The new device uses only a small strip specimen instead of the complete cylinder.

Aid in setting up a plant to build light cars and other vehicles has been sought of the Australian government by an Anglo-Italian group representing the Fiat works of Italy. The group plans to invest about $11,400,000 in the venture.

Some $7 million will be spent for U.S. machine tools by five French automobile manufacturers who are planning to tool up for new models. Simca and Citreon will place the bulk of the orders, which will be financed through ECA. The British Ford company expects to purchase $2.5 million of machine tools in this country in the near future, with ECA doing the financing.

Improvement of 2-3% in productivity was made in 1949 by U.S. industry, according to preliminary estimates by top government economists. This was in contrast with poor showing in 1947 and 1948. Gain in productivity should be 2-3% each year for next five years, Washington believes.

Estimates on parts for overhead-valve, six cylinder engine are being sought by Ford from Detroit tool shops. This is only one of two or three new Ford engines, Detroit reports say.

Chris-Craft Corp. has completed arrangements with a Detroit foundry to make its propellers. In fact, Chris-Craft intends to go into the propeller business on a sizable scale, selling to the trade as well as meeting its own needs (for some 50 different-size wheels).

Rapid advance and return at 1000 ipm is incorporated in 84-in. stroke, 750-ton hydraulic drawing press developed by HPM. First unit is installed at Scaife Co., Oakmont, Penn., converting 12-gage steel 38¼ in. in diameter into deep-drawn shell 24½ in. deep by 14½ in. in diameter in one draw. Production rate is 100-144 per hour. Schnell Tool & Die developed dies which first make 21¼-in.-diameter by $12\frac{3}{16}$-in. cup, then reverse draw up into main ram.

Gaging Metalworking

January is proving to be a good month for metalworking production. Some of the impetus lost in December as an aftermath of the steel strike has been regained. Backlogs, in general, are holding up well. February looks like an active month, too.

Pick-up has occurred in certain machinery lines, including machine tools. Consumer-goods manufacturers are well satisfied with the short-term outlook. Export demand promises well.

Automobiles and television are the two "hottest" metalworking products. They will keep many parts suppliers busy the next few months.

Appliance Output High

Household appliances, too, should yields lots of business in 1950. A total of over 41 million units of all kinds should be produced and sold this year, General Electric officials estimate. That will be about equal to the 1949 showing. Included in the total are: 7 million electric clocks, 6½ million irons, 4.3 million toasters, 3.9 million refrigerators, 3 million vacuum cleaners, 2.9 million electric fans, 2.7 million washing machines.

Main problem immediately ahead is one of getting the steel with which to meet production schedules. One of largest appliance makers is fortunate in having its own hot-sheet mill, tonnage from which supplements its regular steel-mill sources.

Europe To Buy Machine Tools

The machine tool outlook is the best in months. In export as well as in domestic business, the situation is improved. Despite higher cost of U.S. machines to foreign buyers as result of devaluation, European countries financed by ECA still are expected to place $70 million of machine tools in this country during the current fiscal year ending next June 30.

There are pent-up paper orders in western Europe for $150 million of American machine tools, if dollars can be obtained. Even if substantial cancellations occur, there are plenty of eager European buyers to take the place of those who fade out. ECA officials do not anticipate that the shrinkage traceable to devaluation will be anywhere near one-half of the piled-up bookings. Hence the $70 million allocated for machine tool buying will be used in full.

$54 Million Yet To Be Ordered

Devaluation will not affect the number of units bought in the United States for this reason: the dollars allotted to European nations by ECA will buy just as many machine tools as before. The catch is that the foreign machine tool buyer has to pay his own government more for it in his country's own currency.

Some $16 million of machine tool purchases in U.S. has been approved by ECA since the beginning of this fiscal year last July 1. That leaves $54 million yet to be placed. The orders for $16 million already in the hands of U.S. builders since midyear 1949 were supplemented by added millions approved at the last minute prior to expiration of the previous fiscal year but translated into actual purchases since July.

Italy and France Good Buyers

Two reasons stand out for European buying of U.S. machines: (1) much quicker deliveries than can be secured from builders in other countries; and time is of the essence in most cases; and (2) types of machines required are made exclusively in this country.

Italy and France provide the most spectacular purchases of U.S. machine tools. Fiat has distributed orders for some $5 million, while five French automobile companies are dickering for $7 million of American machines. Western Germany, too, is a lively source of business.

While ECA-financed orders draw attention, domestic bookings of machine tools have been somewhat better. The automobile industry continues as the best customer. But sales to defense contractors also have been brisk lately.

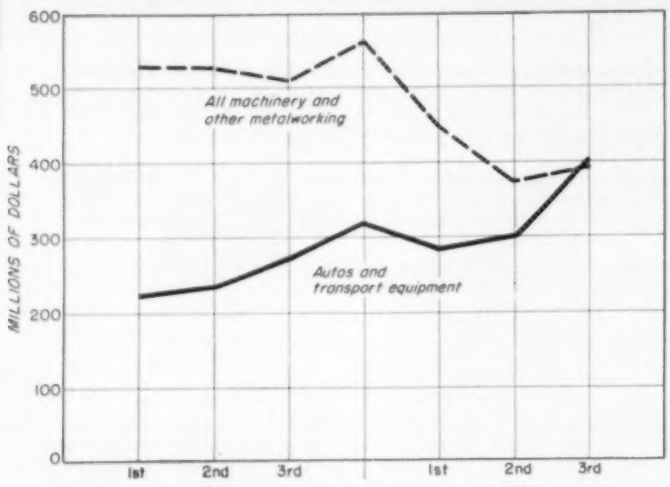
The machine tool industry is not overlooking the fact that $27 million of the military-aid funds for western Europe has been earmarked for machine tools. It appears likely that this sum will be stepped up rather than cut down later on.

Sheet and Strip Critical

Steel operations will stay at a high level through the first quarter. The economy lost 8 million tons of raw steel during the strike; and it will take many more weeks to make up the shortage thus created. To aid steel mills, certain users are giving advance orders earlier than usual. Mills under the circumstances can do a better job of scheduling to meet delivery needs.

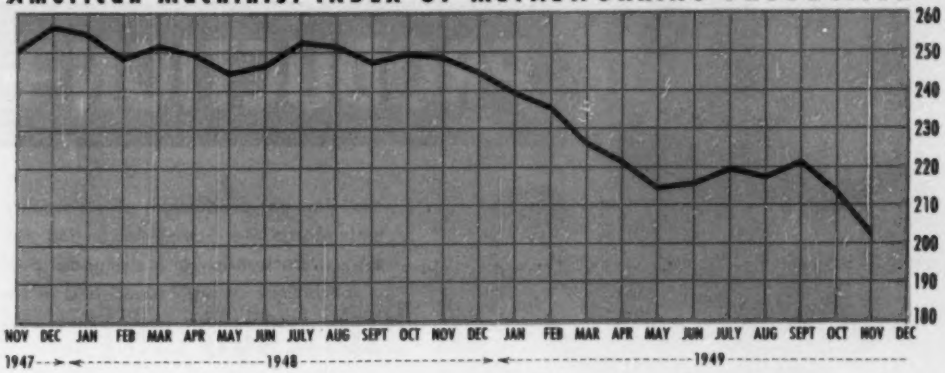
Hot and cold rolled carbon sheets,

RISE IN TREND OF METALWORKING PROFITS



Data: Federal Trade Commission; McGraw-Hill Dept. of Economics

American Machinist INDEX OF METALWORKING PRODUCTION



INDEX		COMPONENTS				
		MACHINERY	ELECTRICAL MFG.	AUTOS, TRUCKS	TRANS-PORTATION EQUIP.	OTHER METAL-WORKING
Nov. 1949	203	191	238	164	229	222
Oct. 1949	214	193	241	203	231	230
Nov. 1948	249	252	272	198	265	266

AMERICAN MACHINIST'S INDEX OF METALWORKING is based on manhours worked in five segments, which are "weighted" as follows: Machinery, 32.5—Auto & Trucks, 22.6—Electrical Manufacturing, 15.4—Transportation Equipment, 12.4—All Other Metalworking, 17.1. Index figures are a percentage of 1939, which equals 100.

particularly the latter, are in the shortest supply of all items. Automotive and tin plate demand accounts for cold-rolled sheets being on the critical list. Some big users are resorting to conversion deals as insurance that their needs will be met. Silicon steel is tight, but is expected to ease gradually.

Copper Strong

Copper is displaying much strength. December was the fifth consecutive month in which it was in heavy demand. And January sales have been high. December shipments exceeded 100,000 tons. If current buying stays at recent levels, a substantial domestic deficiency will appear soon. The world deficiency, in fact, is running at about 20,000 tons a month. The tightness in copper will continue until foreign producers increase their output, or until demand subsides.

There is plenty of aluminum to go round. Recent shortages have about disappeared. Lead, by contrast with copper, is weak.

Defense Orders To Grow

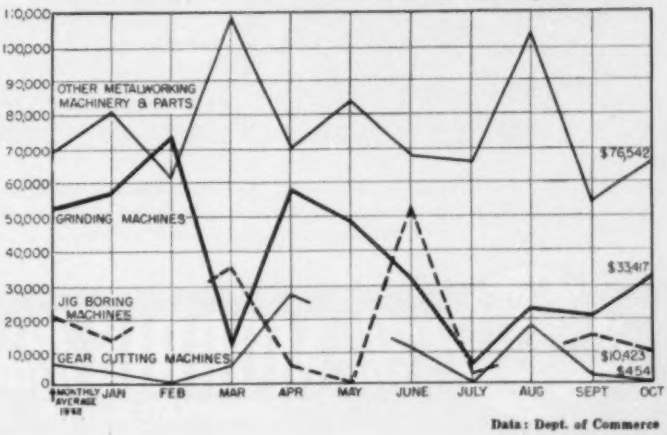
The defense program for fiscal 1951 will dump considerable business into the metalworking industries. Some $200 million, for instance, will go for ammunition (including guided missiles), $276 million for hard goods such as communications equipment, $150 million for weapons, and $2 billion for aircraft.

Tool and Die Work Expands

The tool and die business has been looking up. December and January have continued the upward swing evident in November, when sales invoiced were higher than for any other month in 1949, except March. Also, at 90% of the same month of the previous year, November was more favorable than for any other month, except February, during 1949.

Orders were distributed somewhat better throughout the industry than previously. Employment rose for the fourth successive month. The weekly average per man in November was 42 hours. That indicated overtime in a number of shops, because many plants were working well under 40 hours. Backlogs still are distributed pretty unevenly.

Slight Increase In Machine Tool Imports



Data: Dept. of Commerce

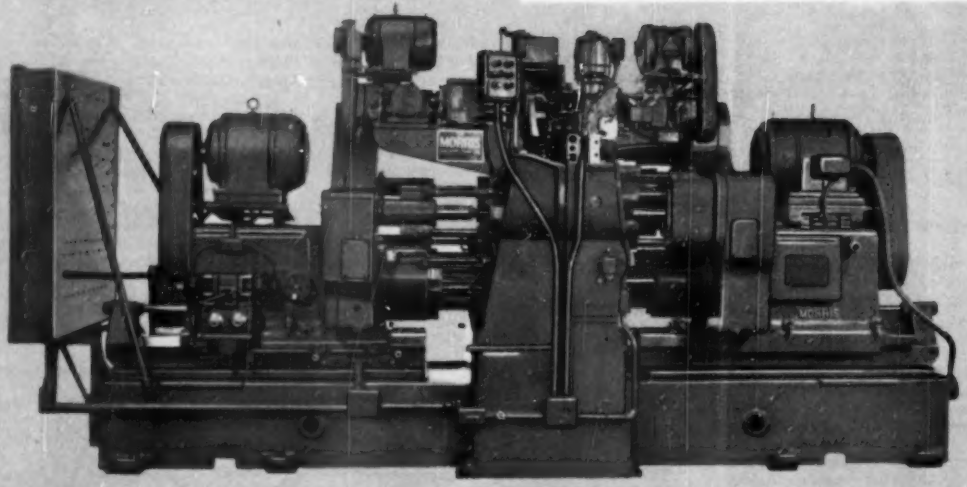
PRODUCTION+

This Hydraulic, Verticle 6-station Automatic Indexing Drilling Machine is designed for drilling, reaming, counterboring and spotfacing operations on housings for automobile oil pumps.

Yes, you get production, plus economy, with Morris Mor-Speed Production Machines. Each machine is designed to do a specific job at high speed and at the lowest possible cost per unit of work produced.

Morris Machines have proved to be a plus factor in hundreds of plants where mass-production of special work pieces is required.

Let our Engineering Dept. save you time and money. *Write for our Mor-Speed Production Machine Bulletin.*



This two-way horizontal, 8-station, automatic indexing machine—drills, reams, countersinks, forms radius and taps refrigeration unit cylinders. Produces a finished piece at each index of machine.

Builders of MOR-SPEED Line

The MORRIS Machine Tool Co.

CINCINNATI 3, OHIO

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

The Good Old Days Were Terrible

How often has someone said to you, "If we could just go back to the good old days"?

Offhand, the idea sounds wonderful. We would be rid of many vexing problems. The atom bomb didn't exist then. Communism wasn't a problem. People didn't want to sneak off for a session with the psychiatrist. Life was simple.

But don't be fooled. The truth is that, as Jones & Laughlin Steel points out, the good old days were terrible.

Fifty years ago workers were on the job 60 to 80 hours a week. They labored mostly with their hands and backs. Their base pay was only 15 to 20 cents per hour.

Most of today's conveniences did not exist. People didn't get around and see the world as they do now; the automobile was a thing of the future.

To get personal, if you were put to the test, would you trade your life today for the life of 1900?

You have almost every modern convenience within arm's reach. Your hours are relatively short. Your work-week extends from Monday morning until Friday afternoon.

Today's necessities and luxuries are priced within the means of the millions. Persons with incomes of $4,000 or less, for instance, buy 60 percent of all television sets.

No longer does a factory employee do back-breaking physical work, as in "the good old days." Mechanical horsepower does it for him. He is paid a basic wage many times what he used to get. And his working conditions usually are of the best.

Chalk up these gains to America's ability to produce. The secret of that ability, Jones & Laughlin states, "is the genius of Americans to invent machines and the willingness of industry to invest huge sums in their purchase, so that men can produce more in less time with less effort."

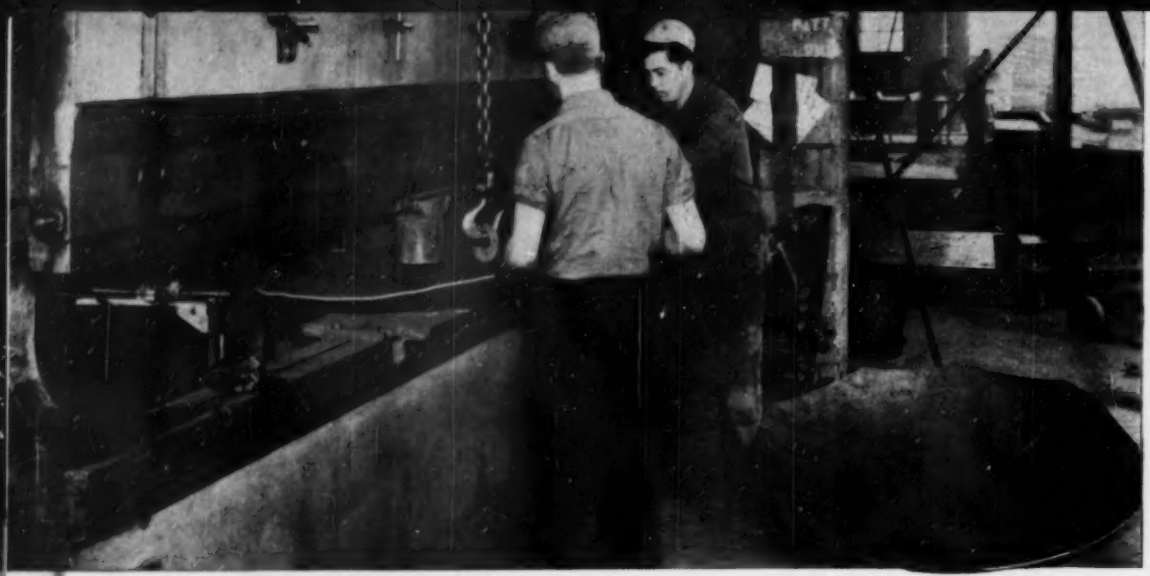
The new machines, and improvements on existing machines, invented in the past year are described in this issue of *American Machinist*. About 1500 separate items are pictured and described briefly.

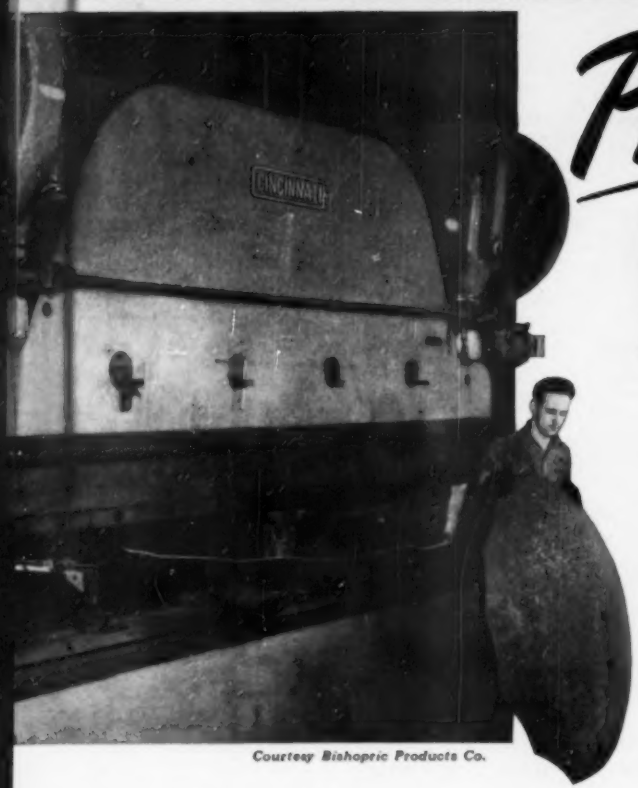
These are the tools which, if put to good use, will enable industry to better its already impressive record. These are the tools which will produce goods at ever lower costs.

These are the tools which make today's living so attractive that by contrast the good old days really were terrible.

Burnham Finney

EDITOR





Courtesy Bishopric Products Co.

Profitable

VERSATILITY

for JOBBING WORK!

Cincinnati All-Steel Press Brakes are used profitably for bending, punching, press work and a great variety of jobbing applications.

Dished heads, a common problem in the tank field, are being formed on this Cincinnati Press Brake in a range of sizes with simple low-cost dies and without change in setup.

This Cincinnati Press Brake, with equally low-cost tooling, simplifies difficult sheet metal and plate jobs and is a versatile, profitable and busy tool in any fabricating shop.

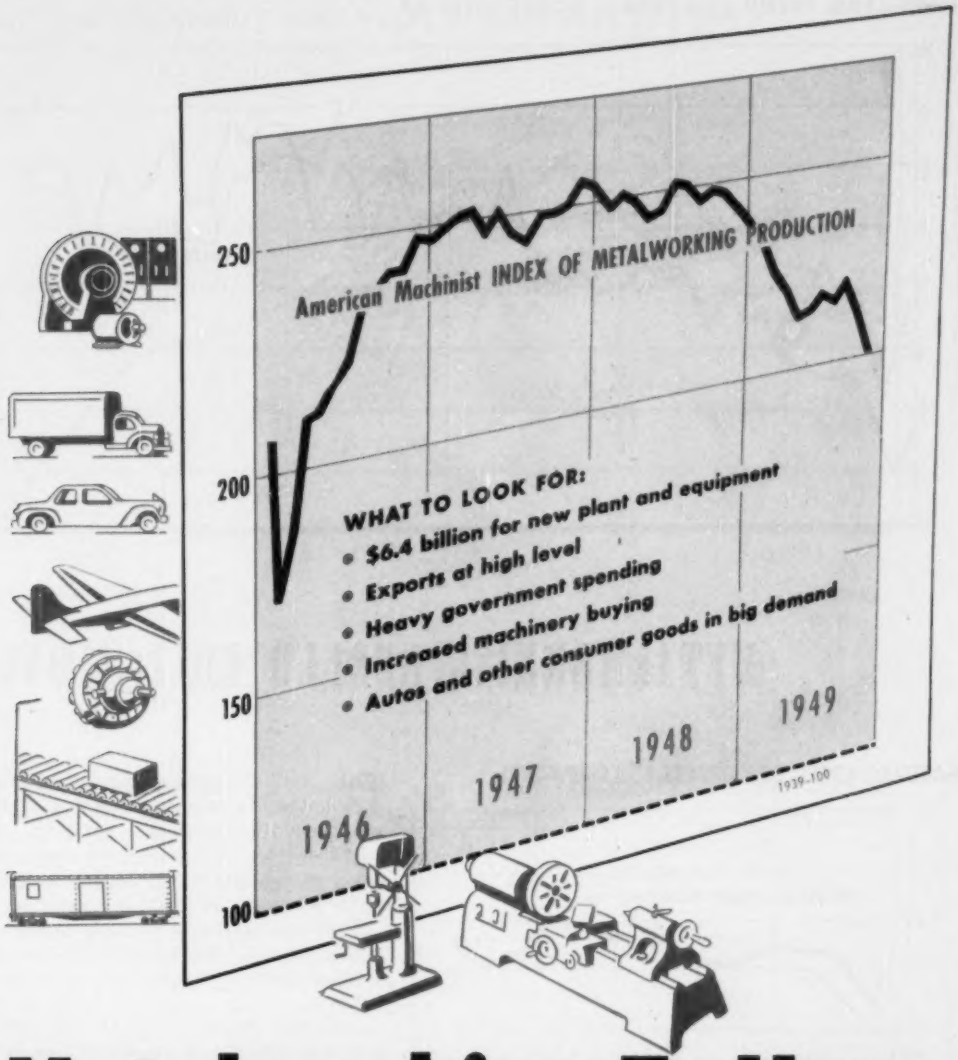
Write for Cincinnati Press Brake Catalog B-2A.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

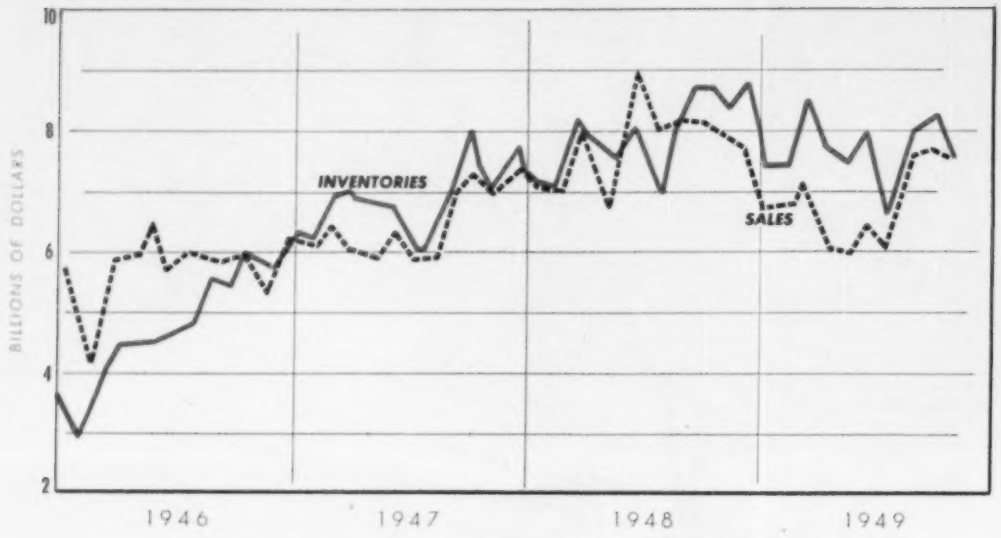
SHAPERS SHEARS BRAKES



Metalworking To Have Good Year in 1950

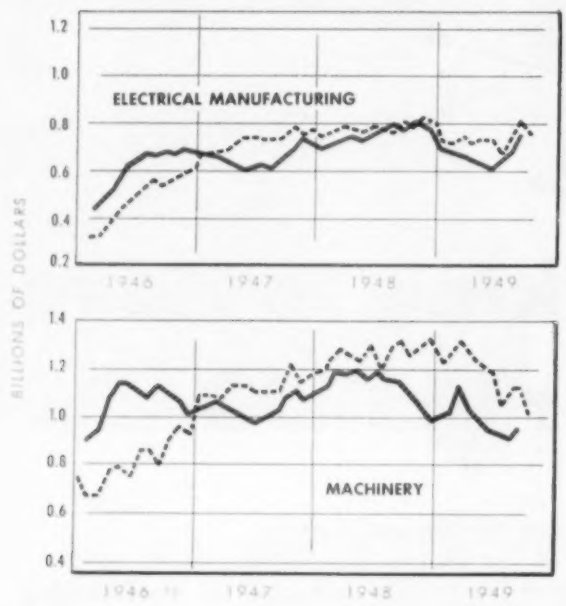
• American Machinist's 1950 Appraisal of Metalworking

LONG-TERM TREND IN DURABLE GOODS STILL UP



METALWORKING SHOULD ROLL ALONG

MANUFACTURERS' NEW ORDERS AND SHIPMENTS



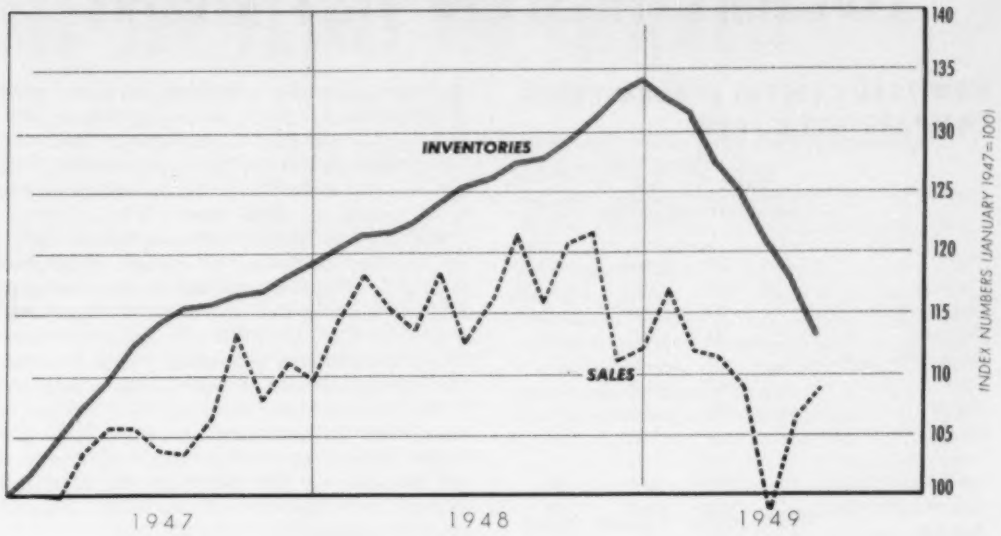
THE nation's metalworking industries should have a very good year in 1950. The year should be about on a par with 1949. And that means that production should roll along at considerably better than double the prewar rate, as it did last year.

First-half prospects, in fact, appear especially bright. Here are some reasons why Metalworking is heading into a prosperous year:

1. Capital expenditures for new plant and equipment will be above the level which has prevailed recently. And as much as 80-90% of the outlay will be for new production machinery for cost-cutting purposes. Details on capital expenditures are given on pages 112 and 113.

2. Government spending will be unusually high the first half of the year, aiding durable and durable consumer goods purchases. Public construction projects and a special dividend to holders of World War II insurance policies will expand the amount of money flowing from Washington into industry and into consumers' hands.

SALES AND INVENTORIES (BOOK VALUE) OF MACHINERY BUILDERS



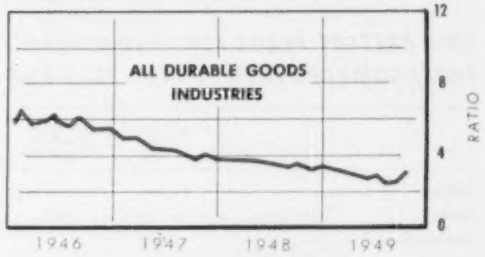
AT MORE THAN DOUBLE PREWAR RATE

3. The automobile industry, always an important barometer, expects to come reasonably close to its last year's all-time record. Some of its executives confidently predict an output in the first half exceeding a 6-million-a-year rate. At the year's opening, cars in dealers' hands were substantially lower than the year before.

4. Exports promise to keep up to a very high level. They won't touch the 1948 peak, but still will be around $12 billion, or almost the same as in 1949. Industrial machinery will be one of the beneficiaries of this demand, which will stem in part from ECA, military aid to western Europe and Export-Import Bank funds. Export details are on page 114.

5. Companies in the electrical-goods manufacturing field are counting on good business this year. In durable goods (turbines, transformers, switchgear, motors, other power-generating units) they will go through 1950 without a letdown. What is more, they entered January with an impressive backlog of orders for household appliances, such as refrigerators, ranges and irons. The upward swing in appliance sales which occurred in midsummer of '49 shows no signs of abatement.

UNFILLED ORDERS VS. SHIPMENTS



6. Business will be stimulated in such lines as machine tools, metal forming machinery, materials-handling equipment and new shop equipment in general by necessity for cost-cutting and for introducing brand-new postwar models. The automobile industry, for instance, promises to spend more money on new tooling for engines and transmissions than in many years.

The first half of 1950, being right at hand, naturally looks brighter than the second half, which is not already here. But there is good reason to believe that any drop after the middle of the year will not be of serious import.

INDUSTRY TO SPEND $12.4 BILLION

HOW 1950 CAPITAL EXPENDITURES COMPARE WITH 1949

(Millions of Dollars)

	1949 EXPENDITURES	1950 PLANNED EXPENDITURES	PERCENT CHANGE
Steel	$ 520	$ 445	—14%
Chemicals	1,100	1,040	— 5
Petroleum Refining	700	580	—17
Machinery	530	460	—13
Electrical Manufacturing	200	135	—32
Autos	420	550	+31
Textiles	410	360	—12
Transportation Equipment	145	95	—34
Food	600	585	— 3
Other Manufacturing	2,575	2,050	—20
Total Manufacturing	**7,200**	**6,300**	**—13**
Railroads	1,310	735	—44
Electric Utilities*	2,220	2,180	— 2
Gas Utilities**	940	870	— 7
Other Transportation and Communications	1,880	1,695	—10
Mining	750	620	—17
All Industry GRAND TOTAL	**$14.300**	**$12.400**	**—13**

*Electrical World Survey. **American Gas Association Survey

HOW PRESENT PLANS FOR 1950 EXPENDITURES COMPARE WITH PLANS A YEAR AGO

	(Millions of Dollars) 1950	% Present 1950 Plans of a year ago
Textiles	$ 360	Not available
Autos	550	108%
Chemicals	1,040	79
Food	585	109
Electrical Machinery	135	84
Machinery	460	74
Petroleum Refining	580	85
Steel	445	91
Transportation Equip.	95	73
Miscellaneous Manufacturing	2,050	136
TOTAL MANUFACTURING	**6,300**	**101**
Railroads	735	74
Other Trans. & Commun.	1,695	111
Mining	620	84
Electric Utilities	2,180	119
Gas Utilities	870	131
ALL INDUSTRY GRAND TOTAL	**$12.400**	**104%**

AMERICAN INDUSTRY is planning to invest $12.4 billion in new plants and equipment in 1950. That is 13% less than was invested in 1949.

Capital expenditures this year, however, will be above the current level. The year-long decline in such outlays is about over.

Some 65% of 1950 capital funds will be used to replace and modernize production equipment. Only 35% will go for expansion of plant facilities. In Metalworking the ratio spent on equipment will be as high as 80-90%. Thus the shift continues away from investments in "brick and mortar" to investments in cost-cutting machinery.

Key metalworking industries vary widely in their plans for new plant and equipment. The automobile industry will spend 31% more than it did list year. On the other hand, electrical machinery manufacturers will spend 32% less and general machinery builders 13% less.

These are the major conclusions of McGraw-Hill's third annual survey of industry's plans to invest in new plants and equipment. Made by McGraw-Hill Department of Economics, it reveals:

1. America's manufacturing industries expect to spend $6.3 billion for new facilities this year.

2. Manufacturing companies in all industries feel that 1950 sales will be about equal to 1949's. Metalworking machinery builders and companies making machines for the service industries (such as laundry and dry-cleaning equipment) expect sales to be up 5% or more. The automobile industry looks for a slight gain over the previous record-breaking year. But general machinery makers anticipate that volume will be off 2%.

3. Special postwar expansion programs now are history. Expansion of capacity in 1950 will be only 3%, a much smaller amount than in earlier postwar years. The rate in 1947 and 1948 was 19%.

4. More than nine-tenths of the money needed to carry out 1950 capital investments will come from internal sources, such as depreciation reserves and retained earnings. Less than one-half of one percent will originate from stock selling.

5. Over one-half of all manufacturers say that they will not cut back their 1950 capital budgets even if general business should decline 20% or more. Almost two-thirds, however, review their plans every month. The 1949 experience, in fact, showed that investment programs can be revised quickly to meet changing economic conditions.

6. Capital expenditures outside of the manufacturing industries—railroads, utilities, mining,

FOR NEW PLANTS AND EQUIPMENT

and other communication and transportation—will be down 13% this year. Public utilities will spend only 2% less than in 1949. But railroads will cut their capital budgets 44%.

For the capital goods industries, the McGraw-Hill survey suggests that a year of good business lies ahead, though it will be at a level lower than the boom-time peaks of 1947 and 1948. The decline in capital expenditures will be offset, in part, by greater government spending the first half of the year. This spending will include more money for public works and payment to veterans of a refund of $2.8 billion on their insurance.

Some key industries may see production go up this year. In machinery, for instance, output dropped rapidly during 1949 to a point 20% below its level of the previous year. At least a slight recovery in the production rate is anticipated.

The McGraw-Hill survey summarizes the investment programs of leading companies employing about 5 million workers. They include the bulk of employees in key industries—steel, automobiles, electrical manufacturing, chemicals, oil, railroads, utilities—which account for three-fourths of American industry's capital expenditures. The estimate for each industry was made by projecting expenditures of companies reporting on the basis of the number of employees compared with the total number in the industry.

HOW INDUSTRY PLANS TO FINANCE 1950 EXPENDITURES

	Percent of Expenditures to be Financed From:			
	Depreciation and Retained Profits	Sale of Stock	Bonds, Bank Loans, or Other Debt	Other
ALL MANUFACTURING	**92%**	**0.4%**	**6%**	**1.6%**
Autos	100	0	0	0
Chemicals	97	3	0	0
Electrical Machinery	99	0	1	0
Machinery	85	0	12	3
Petroleum	96	0	2	2
Steel	88	0	12	0
Transportation Equip.	100	0	0	0
Food	81	0	19	0
Textiles	94	0	6	0
Other Manufacturing	90	0	6	4
Railroads	68	0	32	0
Mining	85	0	9	6

1950 EXPENDITURES FOR MACHINERY COMPARED WITH 1949

Agricultural Machinery	+ 2%
Service Industry Equipment	— 3
Metalworking Machinery	—10
Engines and Turbines	—12
Office and Store Machinery	—20
Construction and Mining Machinery	—22
Special Industry (textile, paper, etc.)	—28
General Industrial Machinery	—32
ALL MANUFACTURING INDUSTRIES	**—13**

MORE MONEY TO BE SPENT FOR COST-CUTTING

	Percent for Expansion	Percent for Replacement
ALL MANUFACTURING	**35%**	**65%**
Automobiles	32	68
Food	32	68
Machinery	11	89
Electrical Manufacturing	15	85
Petroleum Refining	37	63
Transportation Equip.	3	97
Textiles	35	65
Steel	14	86
Chemicals	60	40

SMALL INCREASES EXPECTED IN NEW FACILITIES AND SALES

	Increase in Capacity in 1950 (percent)	1950 Sales Compared with 1949 (percent)
ALL MANUFACTURING	**3%**	**—4%**
Autos	1	+2
Chemicals	8	+4
Food	4	+1
Electrical Machinery	1	Same
Machinery	3	—2
Petroleum Refining	3	+2
Steel	1	—2
Textiles	6	+1
Other Manufacturing	2	—3

METALWORKING EXPORTS STAY UP ALONE

METALWORKING exports in 1950 should be very close to the high level maintained the past year.

This will be true despite a decline in the nation's total export trade from some $17 billion in 1949 to around $15.5 billion the coming year.

Here is the reason: the Marshall Plan countries are expected to cut their purchases of such items as wheat and coal, leaving a larger share of available dollars for metalworking products than in 1949.

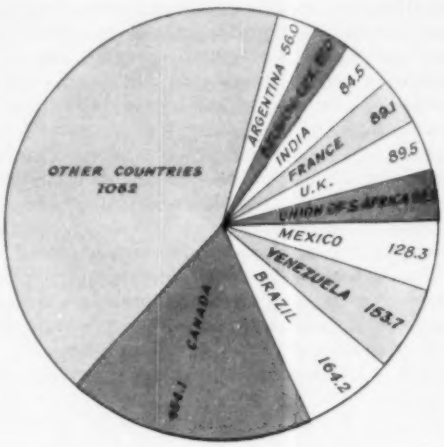
This discernible trend might well bring gains in foreign sales for some machinery lines. But obviously the outlook depends in large measure on continuing stability in western Europe. Another severe dollar crisis, for example, might result in still tighter restrictions on dollar imports.

In competing with American companies, the British are handicapped by slow production and long delivery dates in markets such as Canada and Latin America. Devaluation gave the British a temporary price advantage in many lines; but British prices are likely to rise as time goes on.

Demand is strong, in any case, for heavy U.S. equipment—construction, electrical and metalworking—because much of it is not duplicated by equipment builders anywhere else in the world.

Agricultural machinery is one line in which European producers will offer strong competition in 1950. Farm machinery exports may drop as much as 20% compared with the past year.

In general, a lack of dollars will be the chief lim-



METALWORKING EXPORTS *IN MILLIONS OF DOLLARS DURING FIRST 8 MONTHS OF 1949 (Ranked by Country)*

	GRAND TOTAL	CANADA	BRAZIL	VENE-ZUELA	MEXICO	UNION OF S. AFRICA	U.K.	FRANCE	INDIA	BELGIUM-LUXEM-BOURG	ARGEN-TINA
Total Machinery & Vehicles	2441.2	454.1	164.2	153.7	128.3	92.1	89.5	89.1	84.5	67.0	56.0
Electrical Machinery & Apparatus	320.5	48.7	27.0	24.5	19.2	9.6	2.7	8.2	10.2	7.5	6.5
Engines, Turbines & Parts	130.3	25.4	6.4	8.0	7.6	2.7	1.9	1.2	19.8	1.6	5.7
Construction & Conveying Machinery	156.7	27.2	15.8	10.3	6.0	9.1	9.3	6.2	4.6	1.9	2.5
Mining, Well, & Pumping Machinery	131.9	20.7	3.5	20.6	9.1	3.8	1.5	5.7	2.9	1.2	3.8
Metalworking Machinery	131.4	17.8	5.4	1.6	3.0	8.4	19.1	16.6	2.8	6.0	3.5
Textile, Sewing & Shoe Machinery	110.3	15.3	8.2	2.4	7.4	0.6	13.9	5.5	4.9	3.7	5.5
Other Industrial Machinery	253.2	45.2	13.9	18.1	19.1	8.8	10.1	8.5	10.4	6.6	6.0
Office Appliances	56.9	7.2	5.0	2.2	2.7	0.8	6.7	2.7	2.5	2.0	0.2
Printing & Bookbinding Machinery	31.0	7.3	1.7	0.9	0.6	1.6	1.8	0.1	2.1	0.6	1.7
Agricultural Machinery	97.0	42.3	3.7	1.2	4.6	6.3	4.4	2.9	1.4	0.7	0.7
Tractors	204.3	76.8	8.5	6.2	8.6	12.0	8.0	7.0	3.9	1.3	1.2
Autos, Parts & Accessories	545.8	94.1	56.4	44.0	32.8	25.5	2.0	3.7	14.5	30.4	5.7
Aircraft Parts & Accessories	68.3	7.7	3.2	2.7	2.1	1.6	5.7	11.2	2.6	2.6	1.7
Other Vehicles & Parts	142.0	14.5	4.0	9.2	3.6	0.8	0.3	6.0	0.3	0.6	10.0
Special Categories*	61.6	3.9	1.5	1.8	1.9	0.5	2.1	3.6	1.6	0.3	1.3

METALWORKING EXPORTS BY PRODUCTS

	(MILLIONS OF DOLLARS) 1948	First 8 Mos. 1949	Percent Change of Monthly Averages 1948-1949
TOTAL MACHINERY AND VEHICLES	3677.9	2441.2	— 0.4%
ELECTRICAL MACHINERY AND APPARATUS*	490.6	320.5	— 2.0
Generators	57.9	36.0	— 6.7
Electrical Distribution Equipment	53.1	39.5	+11.7
Motors, Starters and Controllers	50.5	31.0	— 7.9
Electric Refrigerators and Appliances	111.6	69.8	— 6.2
ENGINES, TURBINES AND PARTS	191.8	130.3	+ 1.9
Steam Engines, Boilers and Accessories	34.5	26.2	+13.9
Internal Combustion Engines	112.3	75.5	+ 0.9
Steam Locomotive and Parts	36.8	25.4	+ 3.5
CONSTRUCTION AND CONVEYING MACHINERY	193.0	156.7	+21.8
MINING, WELL AND PUMPING MACHINERY	174.2	131.9	+13.6
Mining and Quarry Machinery	49.6	39.3	+19.0
Well and Refining Machinery	86.3	62.2	+ 8.1
Pumping Machinery	38.3	30.1	+17.8
METALWORKING MACHINERY	157.1	131.4	+25.5
Machine Tools	81.0	59.0	+ 9.3
Lathes	16.3	11.6	+ 6.7
Milling and Gear Cutting Machinery	24.6	17.6	+ 7.3
Planes and Shapers	2.8	1.6	—14.3
Grinding Machines	11.9	10.1	+27.7
Machine Tool Parts and Equipment	25.4	18.1	+ 7.1
Other Metalworking Machinery	65.6	64.0	+46.3
Sheet and Plate Metalworking Machinery	16.8	15.8	+41.1
Forging Machinery and Parts	6.1	4.4	+ 8.2
Rolling Mill Machinery and Parts	27.7	36.6	+98.2
Foundry Equipment and Parts	4.3	3.3	+16.3
Hand Tools	10.5	6.1	— 7.6
TEXTILE, SEWING, AND SHOE MACHINERY	152.1	110.3	+ 8.8
OTHER INDUSTRIAL MACHINERY	380.6	253.2	— 0.2
OFFICE APPLIANCES	86.9	56.9	— 1.7
PRINTING AND BOOKBINDING MACHINERY	44.9	31.0	+ 3.5
AGRICULTURAL MACHINERY OTHER THAN TRACTORS	113.9	97.0	+27.7
TRACTORS*	268.0	204.3	+14.3
AUTOMOBILE PARTS AND ACCESSORIES	929.3	545.8	—11.9
Motor Trucks, Buses and Chassis	353.8	160.9	—31.8
Passenger Cars and Chassis	281.0	151.4	—19.2
Secondhand Autos, Trucks and Buses	114.4	7.2	— 5.3
AIRCRAFT PARTS AND ACCESSORIES*	153.6	68.3	—33.3
OTHER VEHICLES AND PARTS	341.9	142.0	—37.7
Merchant Vessels	256.0	104.2	—38.9
Freight Cars	13.2	12.6	+43.2
SPECIAL CATEGORIES		61.6	

Special categories begun in May 1949. Data for these groups not directly comparable Source: U.S. DEPARTMENT OF COMMERCE

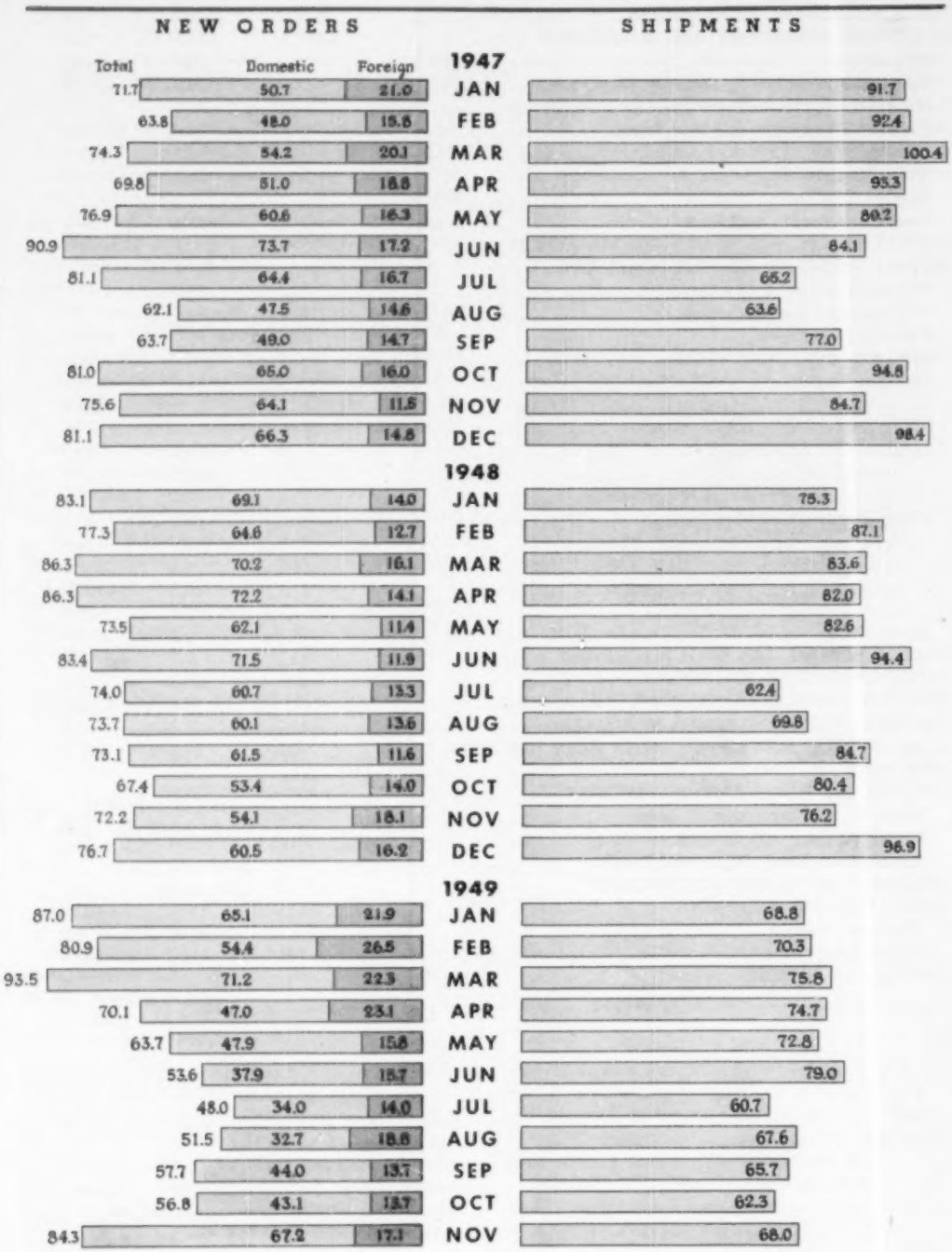
itation imposed on metalworking exports this year.

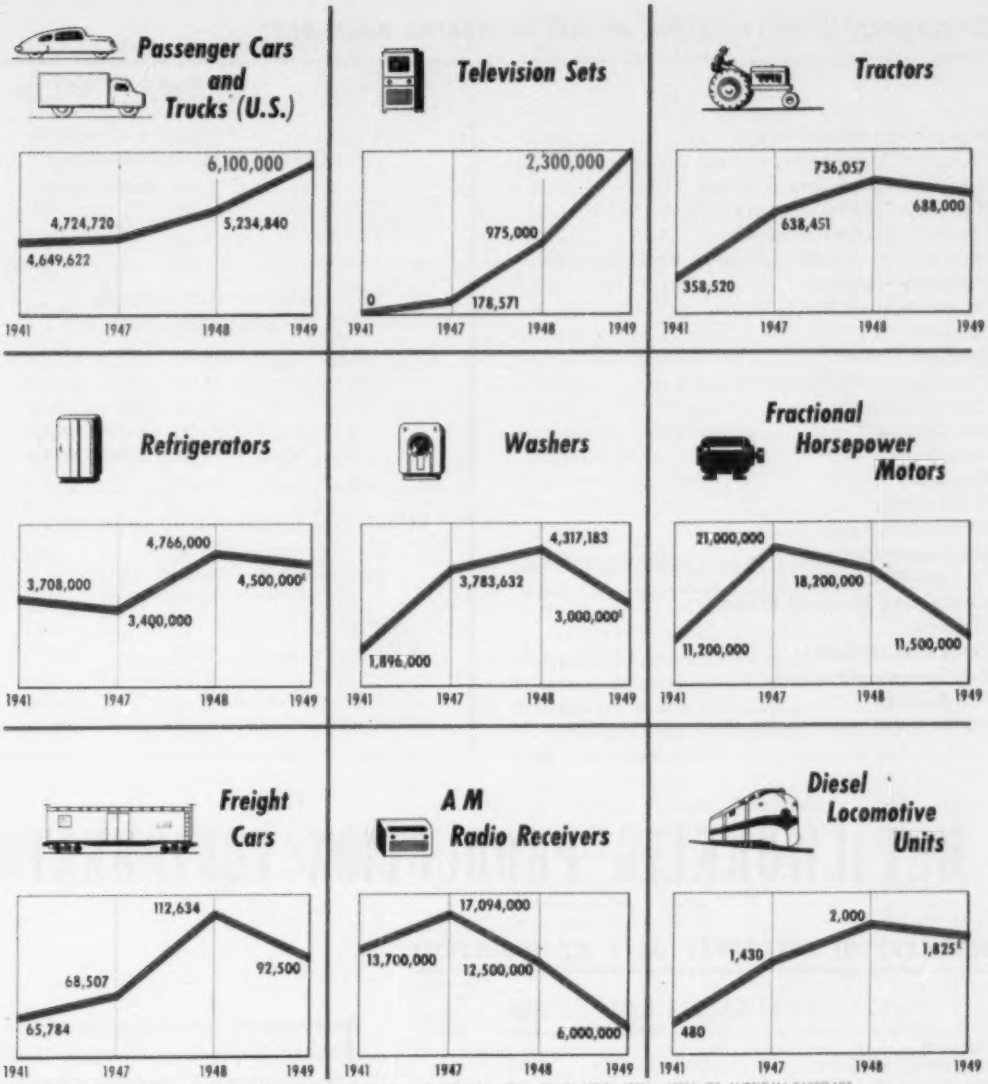
Export figures available at press time do not reflect fully September's round of currency devaluation among some 30 countries. They do show, however that metalworking volume held up well with the main exceptions of automobiles, aircraft parts and accessories, and ships. There were widespread restrictions against importation of American motor cars in many other countries.

In the export figures for 1949 is a new classification, "Special Categories," introduced in May in the interest of national security. It is made up of items normally included in the classifications marked in the table by asterisks. The result is that 1949 figures in these categories are not fully comparable with 1948 figures.

NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS

(AVERAGE 1945-6-7=100)





SOURCE: AUTOMOBILE MFRS. ASSN., NEMA, AMERICAN WASHERS AND IRONERS ASSN., RADIO MFRS. ASSN., ASSN. OF AMERICAN RAILROADS

MOTOR CARS AND TELEVISION BREAK RECORDS

The year 1949 set new production records. The automobile industry turned out 6.2 million units to top the long-standing 1929 total. Output of television sets, at 2.3 million units, was well over twice the 1948 mark and 12 times the 1947 volume. 1950 production is expected to run 3,700,000 sets.

Metalworking production as a whole was off, as shown by the American Machinist Index. Tractors, refrigerators, washers, fractional horsepower motors and freight cars were below the previous year's figures. Backlogs of freight car builders almost vanished by the end of 1949.

GEOGRAPHICAL DISTRIBUTION OF METALWORKING EQUIPMENT

	MACHINE TOOLS	METAL FORMING MACHINERY	OTHER SHOP EQUIPMENT
Massachusetts-Rhode Island	149,536	27,894	56,969
Bridgeport-New Haven-Hartford	107,983	23,445	36,576
New England (excluding above)	61,986	10,819	25,512
New York City-Newark-Jersey City	140,785	39,544	64,388
Buffalo-Rochester-Syracuse	48,787	14,744	17,519
Philadelphia (plus Allentown, Bethlehem, Scranton, Wilkes-Barre)	73,941	21,879	47,223
Pittsburgh-Wheeling	28,058	12,993	22,503
Middle Atlantic States	130,111	30,065	68,064
Baltimore	7,423	1,629	4,097
Southern States	135,028	28,610	63,940
Cleveland-Akron-Canton-Youngstown	92,300	24,216	46,899
Cincinnati-Dayton	32,863	10,663	17,599
Detroit-Toledo	122,443	33,759	44,014
Milwaukee	37,315	7,370	20,938
Chicago	120,437	42,871	61,655
Indianapolis	11,580	2,539	7,777
Midwestern States	273,829	78,479	160,517
Minneapolis-St. Paul	11,883	4,333	6,823
St. Louis-Kansas City	36,257	18,753	17,362
Central and Mountain States	42,007	9,717	27,126
Houston	6,772	445	5,204
Southwestern States	29,373	8,505	24,799
San Francisco-Oakland	12,375	4,153	9,167
Los Angeles	30,368	8,589	17,782
Pacific Coast (except San Francisco-Oakland-Los Angeles)	18,725	5,243	10,830

METALWORKING PRODUCTION EQUIPMENT

SUMMARY OF INVENTORY DATA BY INDUSTRIES

	MACHINE TOOLS	METAL FORMING EQUIPMENT	OTHER SHOP EQUIPMENT	% of total equip. in each industrial division
Agricultural Machinery	48,498	10,623	36,854	3.2
Construction, Mining, Oil Well	34,983	5,627	32,888	2.3
Metalworking Machinery	147,327	7,193	46,853	6.4
Special-Industry Machinery	136,412	13,993	40,430	6.1
General Industrial Equipment	99,441	12,702	45,399	5.1
Office & Store Machines	45,645	10,700	8,875	2.1
Domestic & Service Equipment	48,151	20,357	27,815	3.1
Electrical Equipment	161,914	52,866	87,913	9.7
Misc. Machine Parts, Jobbing	100,847	13,090	35,674	4.8
Motor Vehicles & Parts	138,595	42,382	68,286	8.0
Aircraft & Parts	54,711	8,013	17,312	2.5
Railroad Equipment	16,075	4,629	14,210	1.1
Fabricated Metal Products	375,717	196,546	227,015	25.7
Shipbuilding, Ordnance, Misc.	240,713	49,701	164,957	14.6
Precision Mechanisms	113,136	22,835	30,808	5.3
TOTAL	1,762,165	471,257	885,280	100.0

THE AMOUNT and relative age of production equipment in the nation's metalworking industries are shown on these two pages. The size of Metalworking also is given, as determined by the McGraw-Hill Census of Manufacturers, the 1949 revision just having been completed. The census reveals that the number of plants employing 21 or more workers is only slightly less today than it was in 1947. And the number of wage earners has dropped very little.

Breakdowns of metalworking pro-

MACHINE TOOLS IN U.S.

Metalworking Plants	1,762,165
Government Agencies	259,000
Maintenance Shops (mostly outside Metalworking)	193,500
College Shops	10,000
TOTAL	2,224,665

PRODUCTION EQUIPMENT IN U.S. METALWORKING INDUSTRIES

	UNITS	10 YR. OLD & OVER	OVER 20 YR. OLD
Machine Tools	1,762,165	43%	21%
Metal Forming	471,257	55	28
Other Equipment	885,280	34	11

SIZE OF METALWORKING INDUSTRIES

As Shown by
McGraw-Hill Census of Manufacturers
(plants with 21 or more workers)

	PLANTS	EMPLOYEES	ESTIMATED EMPLOYEES IN PLANTS OF ALL SIZES
1947	19,908	5,675,600	5,824,800
1949	19,499	5,445,500	5,660,600

RESOURCES SHOWN

duction equipment by 15 industrial classifications and by 25 geographic areas are printed. Tables and charts are taken from AMERICAN MACHINIST's Mid-Century Inventory, which was published in the Nov. 3, 1949, issue. This Inventory was the sixth Five-Year Inventory made by AMERICAN MACHINIST, the first having been published in 1925. Reprints of the 96-page Mid-Century Inventory can be secured by writing to Editor, AMERICAN MACHINIST, 330 W. 42nd St., New York 18, N. Y.

MACHINE TOOLS BY TYPES

	UNITS	10 YEARS AND OVER
Lathes	396,464	47%
Grinders	362,776	37
Drilling Machines	361,935	41
Milling Machines	182,284	45
Polishing and Buffing	85,735	39
Cutoff Machines	80,110	33
Boring Machines	56,011	43
Threading (except pipe)	54,029	54
Gear Cutting & Finishing	44,216	50
Shapers	42,147	63
Honing and Lapping	17,170	24
Planers	16,570	75
Broaching Machines	12,891	31
Pipe Cutting & Threading	12,419	46
Contour Sawing & Filing	7,568	26
Gear Checking Machines	4,341	32

METAL FORMING MACHINERY BY TYPES

	UNITS	10 YEARS AND OVER
Mechanical Presses (power driven)	230,392	61%
Punching & Shearing Machines	59,014	59
Bending & Forming Machines	52,081	50
Riveting Machines (not portable)	33,283	39
Hydraulic Presses	32,159	37
Forging Machinery	24,195	72
Wire & Strip Forming Machines	13,687	67
Plastic Molding Machines	8,360	33
Die Casting Machines	8,258	17
Pneumatic Presses (except hydro-pneumatic)	5,089	18
Swaging Machines	4,739	60

OTHER SHOP EQUIPMENT BY TYPES

	UNITS	10 YEARS AND OVER
Hoists (including jib and rail mounting)	270,230	35%
Electric Welding Machines (not hand)	165,101	30
Materials Heating Equipment	106,342	29
Industrial Trucks	95,199	23
Cleaning Equipment	91,541	36
Cranes, Overhead Traveling	48,279	58
Plating Equipment	47,176	28
Air Compressors	39,797	28
Gas Welding, Cutting Machines (not hand)	15,747	23
Balancing Machines	5,868	38

American Machinist INDEX OF

AM INDEXES OF METALWORKING ACTIVITY, REVISED 1939 = 100

		TOTAL METALWORKING	ELECTRICAL MFG.	MACHINERY	AUTOMOBILES & TRUCKS	OTHER TRANSPORTATION	OTHER METALWORKING
1946	January	204	238	201	99	303	181
	February	172	167	173	91	266	160
	March	185	181	184	106	268	179
	April	211	220	198	149	283	196
	May	212	233	200	151	171	198
	June	219	248	210	156	267	205
	July	223	249	211	169	264	209
	August	234	267	219	183	262	227
	September	238	278	225	187	249	234
	October	242	287	232	186	258	239
	November	242	293	233	186	252	245
	December	249	301	238	189	271	253
1947	January	248	300	251	179	267	267
	February	250	300	252	184	266	269
	March	252	302	253	188	266	270
	April	253	297	258	186	275	272
	May	249	296	256	173	272	271
	June	252	297	254	184	272	272
	July	247	296	253	178	255	268
	August	244	292	251	174	254	264
	September	250	294	254	189	253	270
	October	250	294	253	190	253	268
	November	251	292	254	194	253	270
	December	257	292	258	207	260	276
1948	January	255	292	261	199	261	272
	February	249	290	259	176	257	271
	March	252	285	260	195	260	269
	April	250	288	255	191	262	267
	May	245	286	257	172	249	268
	June	247	282	260	180	249	267
	July	253	281	261	195	265	270
	August	252	284	260	189	266	274
	September	248	279	256	187	267	267
	October	250	275	254	199	266	269
	November	249	272	252	198	265	268
	December	245	266	247	203	258	262
1949	January	240	261	245	203	251	250
	February	236	255	239	197	256	246
	March	227	244	230	187	252	236
	April	222	241	220	193	243	230
	May	215	240	211	173	244	228
	June	216	229	204	198	242	231
	July	220	228	203	209	260	233
	August	218	229	199	210	238	235
	September	222	237	199	216	248	239
	October	214	241	193	203	231	230
	November	203	238	191	164	229	222

METALWORKING PRODUCTION REVISED

THE AMERICAN MACHINIST Index of Metalworking Production, and the five components which comprise it, have been revised to reflect postwar changes in the metalworking industries. The revision raises the level of the overall index slightly, from 196 to 203 in November, 1949.

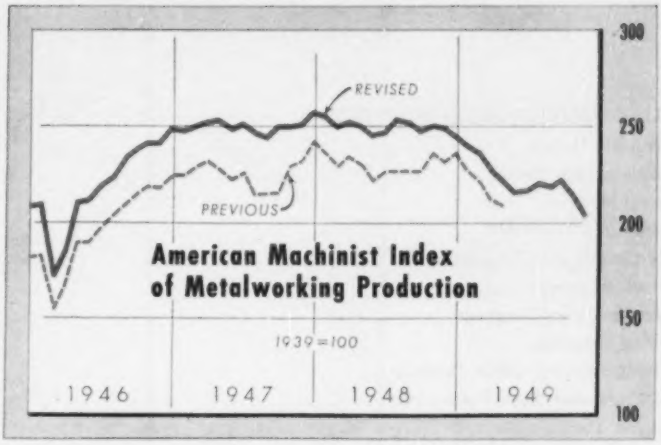
A broad overhaul of employment figures by the U.S. Bureau of Labor Statistics is responsible for the revision. The index is based on figures for employment and hours worked in the metalworking industries. Manhour figures are adjusted for changes in productivity — output per manhour — to give a measure of actual production.

BLS's revision consists of: (1) reclassifying companies by their major postwar product; (2) classifying industries by government standard coding system; (3) bringing employment figures into line with employment data developed from social security records, reports of Interstate Commerce Commission, and other official figures.

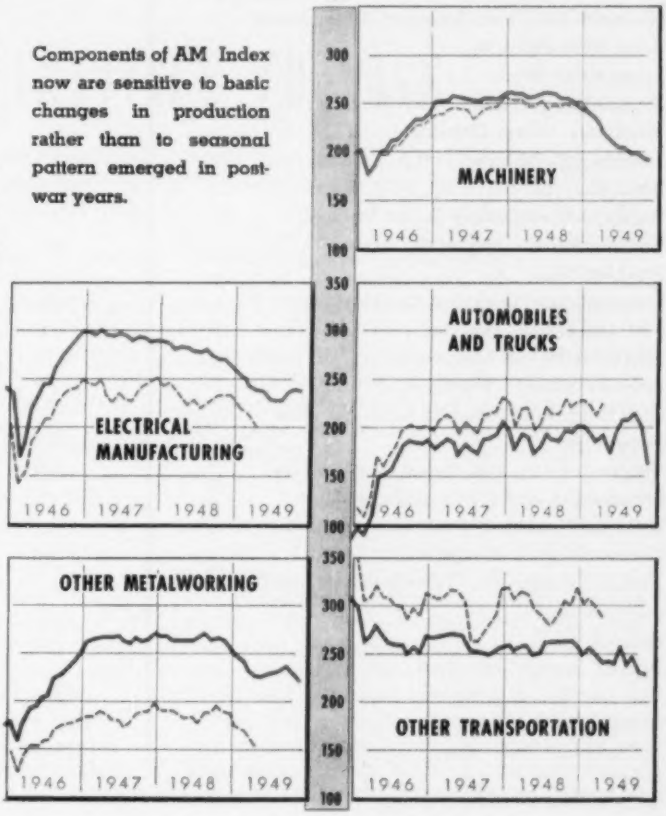
The result directly affects three components of the American Machinist Index. A group of companies formerly classified as part of the automobile industry has been shifted to electrical manufacturing. Hence the auto industry component index drops and the electrical manufacturing component gains.

The index measuring "other metalworking" activity rises because BLS has enlarged its coverage among industries in this category. Professional and scientific instruments, for example, are now included in this group.

All components, except autos, have been adjusted to reflect the postwar pattern of seasonal activities.



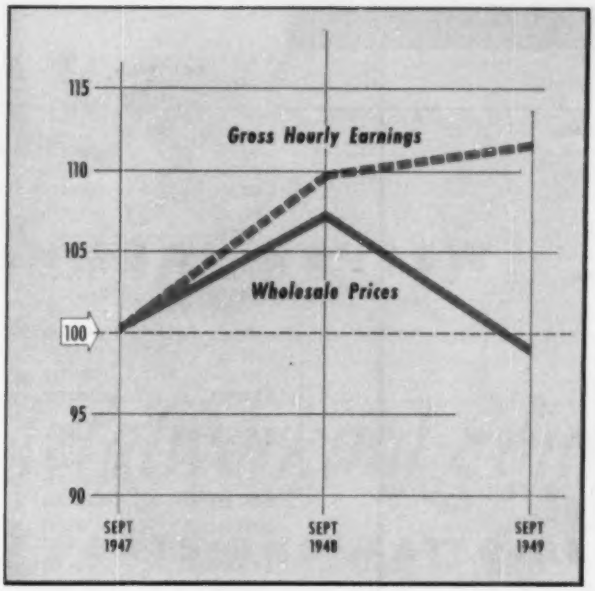
Components of AM Index now are sensitive to basic changes in production rather than to seasonal pattern emerged in postwar years.



HOURLY WAGES COMPARED WITH 1947 AND 1948

	AVERAGE GROSS HOURLY EARNINGS			
	Sept. 1947*	Sept. 1948*	Sept. 1949	% Change Sept. 1948 Sept. 1949
ALL MANUFACTURING INDUSTRIES	**126.7**	**138.6**	**140.7**	**+1.5**
Durable Goods	133.2	145.7	148.1	+1.6
Non-durable Goods	119.2	130.4	132.8	+1.8
Steel Mills	151.2	167.5	167.5	-0-
Gray Iron Foundries	133.5	144.6	145.6	+0.7
Malleable Iron Foundries	139.2	151.8	154.6	+1.8
Steel Foundries	141.5	153.3	152.0	—0.8
Iron and Steel Forgings	150.2	166.4	165.0	—0.8
Wire Drawing	143.5	161.3	162.3	+0.6
Tin Cans and Other Tinware	126.5	140.4	143.3	+2.1
Cutlery and Edge Tools	117.5	125.4	128.1	+2.2
Hand Tools	129.5	140.9	142.2	+0.9
Oil Burners, Non-electric Heating & Cooking Apparatus	131.2	143.1	143.8	+0.5
Structural Steel and Ornamental Metalwork	132.5	143.9	148.6	+3.3
Boiler Shop Products	135.7	148.2	149.6	+0.9
Sheet Metal Work	130.7	144.1	145.8	+1.2
Stamped and Pressed Metal Products	136.1	149.4	155.9	+4.4
Machinery Except Electrical	139.2	151.2	153.8	+1.7
Engines and Turbines	149.5	161.6	162.5	+0.6
Tractors	145.9	158.8	159.0	+0.1
Agricultural Machinery Except Tractors	137.0	149.1	154.6	+3.7
Construction and Mining Machinery	135.3	147.7	146.8	—0.6
Machine Tools	140.0	148.5	151.2	+1.8
Metalworking Machinery Except Machine Tools	140.6	154.1	154.5	+0.3
Machine Tool Accessories	149.6	160.8	164.1	+2.1
Special Industrial Machinery	134.8	147.1	151.7	+3.1
General Industrial Machinery	137.7	149.2	150.7	+1.0
Computing Machines and Cash Registers	152.7	165.2	171.1	+3.6
Typewriters	130.3	135.4	144.0	+6.4
Service Industry and Household Machines	137.4	151.9	155.1	+2.1
Refrigerators and Air-Conditioning Units	137.7	151.9	157.7	+3.8
Electrical Machinery	131.7	143.5	144.8	+0.9
Communications Equipment	124.8	134.8	136.4	+1.2
Radios, Phonographs, Television Sets and Equipment	117.3	127.2	129.0	+1.4
Automobiles	151.0	167.8	171.8	+2.4
Aircraft	138.4	150.0	154.1	+2.7
Aircraft Engines and Parts	145.3	160.3	160.3	-0-
Ship and Boat Building and Repairing	146.0	160.9	161.7	+0.5
Locomotives and Parts	156.3	160.3	166.3	+3.7
Railroad and Street Cars	139.3	155.9	158.8	+1.9

Source: Bureau of Labor Statistics
*Revised on basis of new industry classification



HOURLY EARNINGS HAVE RISEN STEADILY THE PAST TWO YEARS. BUT PRICES HAVE DROPPED RECENTLY

WAGE RATES CONTINUE TO RISE

PRICES and wages went in opposite directions the past year. The wholesale price index for the country dropped over 8% while hourly wage rates went up slightly (see chart).

One should remember, too, that hourly rates no longer reflect all the labor cost of industry. They do not include pensions, insurance and other social benefits often referred to as "fringe" benefits. For that reason, it is hard to show in any chart or table the *total hourly cost* of the worker, as against merely the hourly wage rate.

Actual hourly earnings went up only mildly from September, 1948, to September, 1949 (see table). The highest increase in Metalworking was in the typewriting field, the gain having been 6.4%. Stamped and pressed metal products rose 4.4%. But most of the boosts were in the zero-to-2% range.

Here, again, it is necessary to bear in mind that most of the fourth-round increases occurred late in the year 1949 and are not reflected in September figures (latest available). Also, "fringe" benefits are not included in hourly earnings.

Note that in the 40 classifications reported, hourly rates are down, compared with the previous year, in three categories: steel foundries, forging shops, and construction and mining machinery companies. Admittedly, the decline is infinitesimal—a fraction of one percent. But in view of the many years during which rates climbed uninterruptedly, even a fractional drop is unusual and perhaps significant.

Two important industries—steel mills, and makers of aircraft engines and parts—showed no change in hourly rates from September to September. Nevertheless, the steel people, for one, have taken upon themselves a healthy increase in labor cost through the grant of pensions, insurance and other social benefits.

Prices did not decline in all lines. They rose slightly in agricultural machinery and in the automobile industry and held level in the iron and steel industry. In certain items, such as plumbing and heating, they fell off sharply.

The so-called "fourth round" of wage increases had not been settled in many industries by the end of 1949. It was anybody's guess then whether any increases would come out of pending negotiations. Whatever the gains, they would be small.

Wage figures for the last three years have been revised by the Bureau of Labor Statistics. Those shown are not directly comparable, therefore, with figures for 1945 and earlier years.

STEEL SHIPMENTS TO CONSUMERS

INDUSTRY	(NET TONS) 1941	1948	(8 mos.) 1949
1. Steel for converting and processing into:			
Wire and Wire Products	535,741	1,132,978	631,423
Other Steel Products and Castings	1,956,853	2,215,436	1,342,173
TOTAL	**2,492,594**	**3,348,414**	**1,973,596**
2. Forgings Other than Automotive	859,191	938,838	572,334
3. Bolts, Nuts, Rivets and Screws	1,160,767	1,284,653	624,731
4. Jobbers, Dealers and Distributors	9,199,811	11,405,749	7,406,840
5. Construction Including Maintenance	5,219,867	7,277,018	5,465,750
6. Contractors Products	2,908,021	2,507,977	1,509,788
7. Automotive			
Passenger Cars and Trucks	6,231,097	5,824,085	4,760,290
Parts Accessories and Supplies	2,587,157	3,933,414	2,897,550
Automotive Forgings	285,251	463,483	228,278
TOTAL	**9,103,505**	**10,220,982**	**7,886,118**
8. Rail Transportation			
Railroad Rails, Trackwork and Equipment	3,533,866	1,997,200	1,490,518
Freight Cars	NA	2,739,119	1,301,744
Other	NA	489,216	308,385
TOTAL	**5,680,801**	**5,225,535**	**3,100,647**
9. Shipbuilding and Marine Equipment	2,733,413	649,413	552,313
10. Aircraft	161,106	35,761	32,632
11. Oil and Gas Drilling	1,735,983	684,478	496,073
12. Mining, Quarrying and Lumbering	249,157	329,090	220,826
13. Agricultural	1,153,678	1,426,943	1,072,431
14. Machinery, Industrial Equipment and Tools			
General Purpose Industrial Equipment	NA	1,445,713	931,237
Tractors	NA	537,299	415,317
Hand Tools	NA	206,456	118,742
Other	NA	999,250	593,466
TOTAL	**1,569,712**	**3,188,718**	**2,058,762**
15. Electrical Machinery and Equipment	1,301,275	1,594,700	851,540
16. Appliances, Utensils and Cutlery	1,746,810	1,959,878	948,156
17. Other Domestic and Commercial Equipment	1,987,569	1,713,806	934,869
18. Containers	4,489,410	5,302,373	3,332,923
19. Ordnance and Other Military	1,413,246	56,029	69,722
20. Export	5,888,746	3,244,888	2,632,647
Unclassified	1,429,500	3,577,695	1,327,510
GRAND TOTAL	**62,484,162**	**65,973,138**	**43,086,837**
		12-mos. Total (est.)	**58,000,000**

PRODUCTION OF MATERIALS AND COMPONENTS

PRODUCT	1948 1st Q	1948 2nd Q	1948 3rd Q	1948 4th Q	1949 1st Q	1949 2nd Q	1949 3rd Q	1949 4th Q
Pig Iron—Total (thousands of tons)	14,792	13,687	15,135	16,441	16,519	15,617	13,200	9,000
Basic (thousands of tons)	11,581	10,668	11,827	12,239	12,809	12,113	10,500	6,900
Foundry (thousands of tons)	799	746	687	538	887	706	615	400
Steel—Total (thousands of tons)	22,021	21,046	21,921	23,652	24,052	21,873	19,084	13,000
Refined Copper (thousands of tons)	307	314	313	300	284	267	251	235
Lead (thousands of tons)	145	148	107	145	149	148	115	140
Slab Zinc (thousands of tons)	215	214	206	219	223	227	219	195
Aluminum (thousands of tons)	146	157	161	159	158	165	158	150
Castings (thousands of short tons)								
Steel	446	447	410	458	420	342	256	200
Gray Iron	3,258	3,116	3,053	3,359	3,102	2,701	2,450	2,000
Malleable	240	238	216	239	211	176	163	135
Copper & Copper Base Alloy	134	128	120	134	108	82	80	70
Zinc & Zinc Base Alloy	58	56	53	55	45	43	49	40
Aluminum & Aluminum Base Alloy	59	54	48	51	42	34	35	30
Steel Forgings (thousands of tons)	366	342	330	379	356	297	254	200
Gears (Mo. Av. Index 1935-1939 = 100)	350.3	309.5	334.8	322.7	300.7	272.3	226.7	200.0

Source: American Iron and Steel Institute, American Zinc Institute, U.S. Dept. of Commerce
*Estimated

AMERICAN MACHINIST

37TH ANNUAL REVIEW

of

Metalworking Equipment

PARTS AND MATERIALS

A concise, classified review of 1500 new products of interest to the metalworking industries. This equipment, introduced during the past year, is available now to help meet the production problems of 1950

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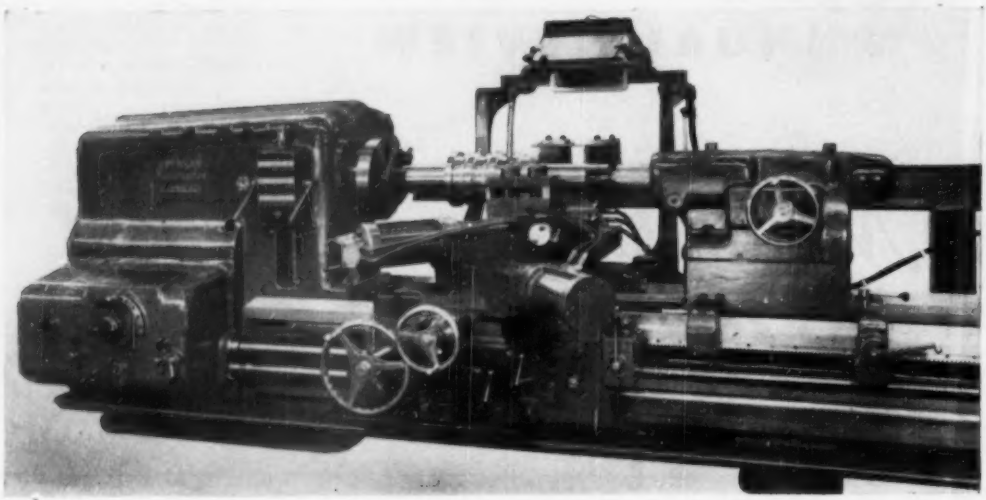
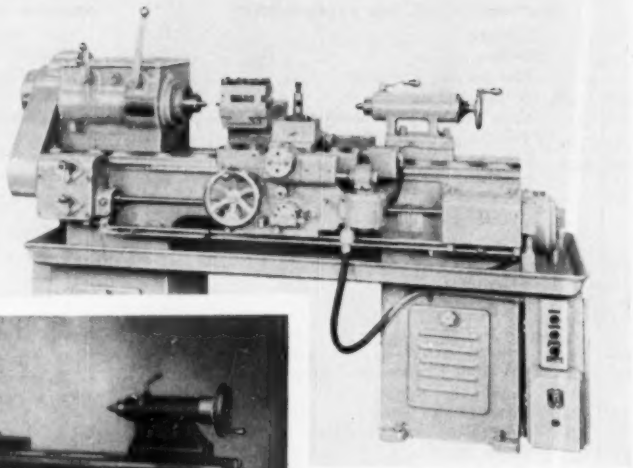
AMERICAN MACHINIST 37TH ANNUAL REVIEW

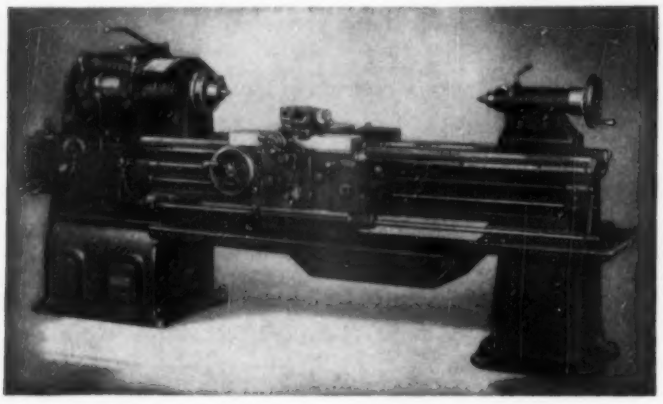
Turning



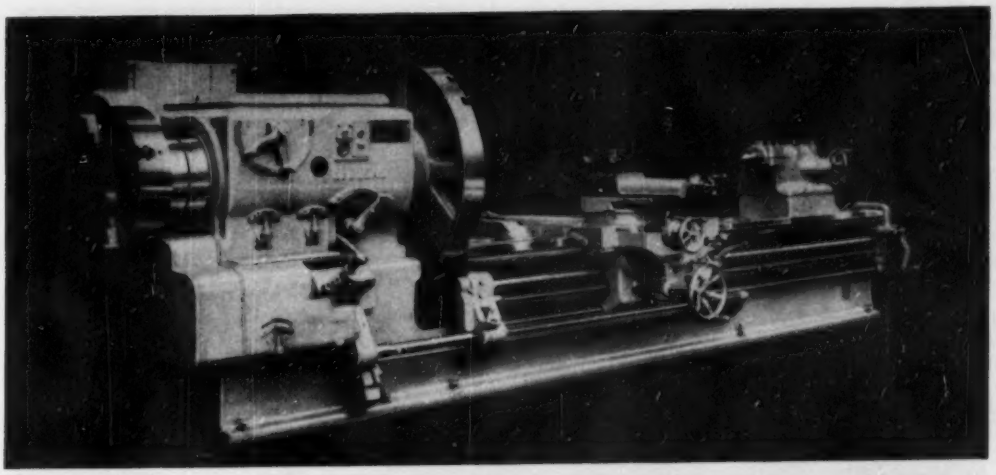
LATHE — *The American Tool Works Co., Pearl St. at Eggleston Ave., Cincinnati 8, Ohio.* A dual-slide all-hydraulic duplicating mechanism on this lathe controls the machine's cutting tool as it reproduces the desired roll shapes from a templet. Lathe is powered by a 40-hp motor and machine rolls up to 26 in. dia. Chilled iron roll (65 scleroscope hard) seen on lathe was completely finished from blank in six hr.



LATHE—*The Boye and Emmes Machine Tool Co., 125 Caldwell Drive, Hartwell, Cincinnati 15, Ohio.* Sixteen-in. lathe is built to operate at spindle speeds to 1080 rpm. It is equipped with anti-friction bearing headstock, gear box, apron, and quadrant.

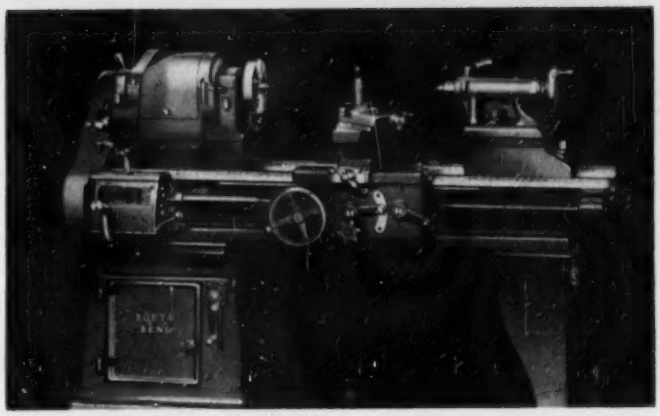


LATHE—*The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* The Clipper high-speed manufacturing lathe runs automatically through a complete cycle, including plunge to depth, turn, tool relief, and rapid traverse to starting position. A high-speed head with motor built in at the headstock furnishes nine spindle speeds varying from 450 to 3600 rpm. Swing over the bed and carriage wings is 14¾ in.

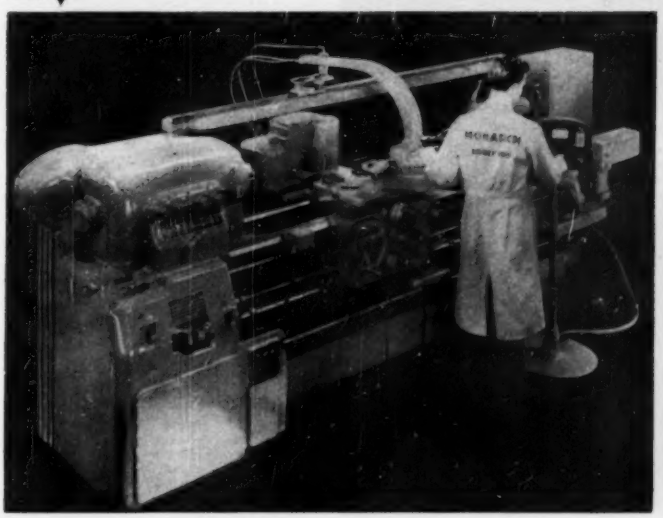


LATHE—*The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* The LeBlond 25-in./50-in. sliding-bed gap, and the 27-in. hollow-spindle lathes have been combined into one machine with a swing capacity of 60½ in. within a 5-ft.-wide gap, and with a spindle hole of 12½ in. The carriage permits facing the full swing of the gap.

LATHE SHIELD—*Frank Gradischnig Co., 2417 No. Cramer, Milwaukee 11, Wis.* Attached by means of a spring clip to any cutting-tool holder, this Plexiglas shield is 3 in. high by 5 in. wide and provides full vision of every cutting operation.

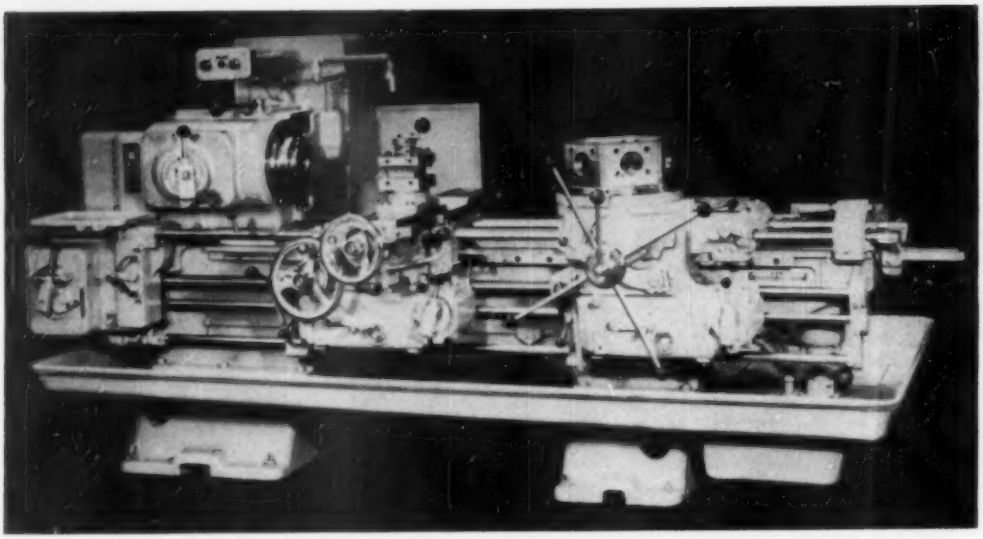


TURNING MACHINE—*The Monarch Machine Tool Co., Sidney, Ohio.* The Air-Gage Tracer Packaged Unit is for application to Monarch 16- and 20-in. series-60 engine lathes, 20-in. Model M, 25-in. Model N, and 32-in. Model NN engine lathes. It provides an individual motor drive for the lathe carriage feed. ↓

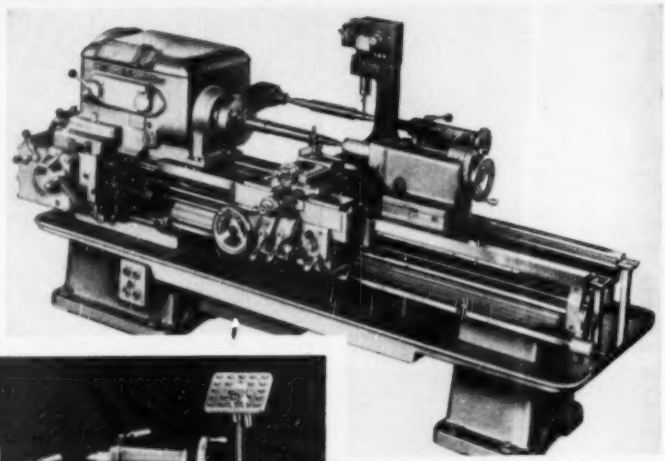


LATHE—*South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* Built primarily for machining large-diameter work that is not excessively heavy, South Bend 16/24-in. lathe has sixteen spindle speeds ranging from 11 to 727 rpm. Maximum swing over the carriage is 24¼ in. Distance between centers varies from 30 to 102 in.

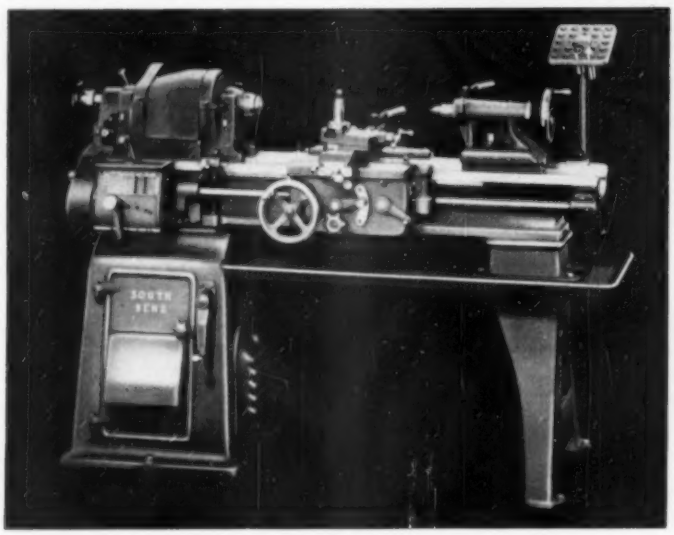
COLLET ATTACHMENTS—*The Monarch Machine Tool Co., Sidney, Ohio.* For application on Series 60 engine and toolroom lathes, this lever-operated collet attachment provides up to 1⅛-in. round-bar stock capacity.



LATHE—*Jones & Lamson Machine Co., Springfield, Vt.* Safety interlocks are incorporated in both the saddle and carriage feed mechanisms of the Model 7A universal turret lathe. The units eliminate the possibility of followers being engaged with the leadscrew when feeds are engaged and vice versa. Lathe has 2½-in. bar and 12-in. chuck capacity.

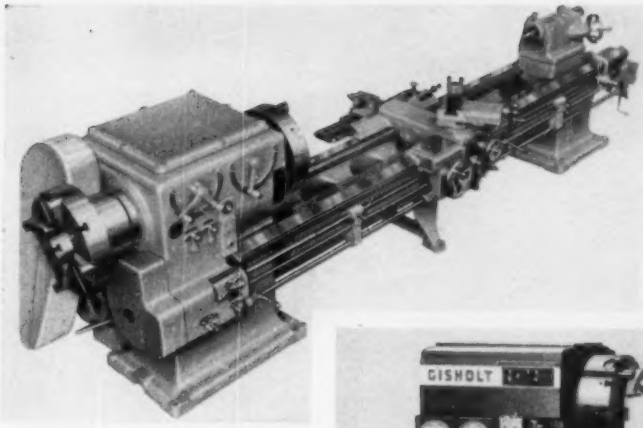


LATHE—*South Bend Lathe Works, South Bend 22, Ind.* Thirteen-in.-swing toolroom and quick-change gear lathes with a 1-in. collet capacity have a new tailstock base with improved bed-way wiper system, and a one-point oiling system for reverse lever bracket and twin-gear bearings. ↓



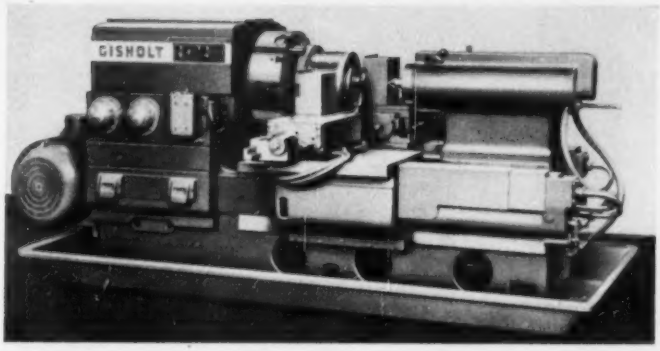
LATHE—*The Lodge & Shipley Co., Cincinnati 25, Ohio.* Tracer-controlled, dual-purpose lathe. The Copymatic incorporates a hydraulic tracer control in the standard model X 16- and 20-in. medium- and heavy-duty, and 25-in. medium-duty lathes.

SPINDLE-SPEED INDEX PLATES —*The Lodge & Shipley Co., Cincinnati 25, Ohio.* Spindle-speed index plate gives the correct lever settings for spindle speed required and safe-horsepower cut that can be taken at given cutting speeds.

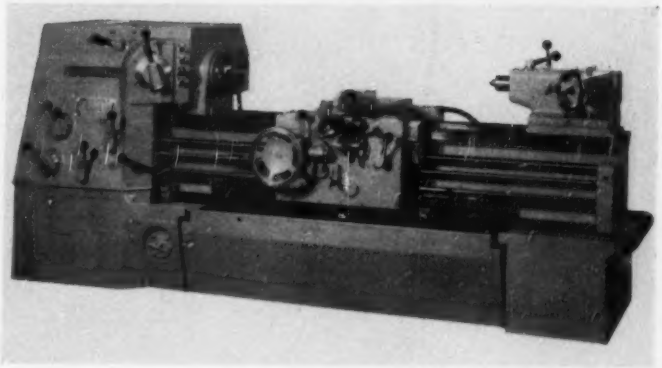


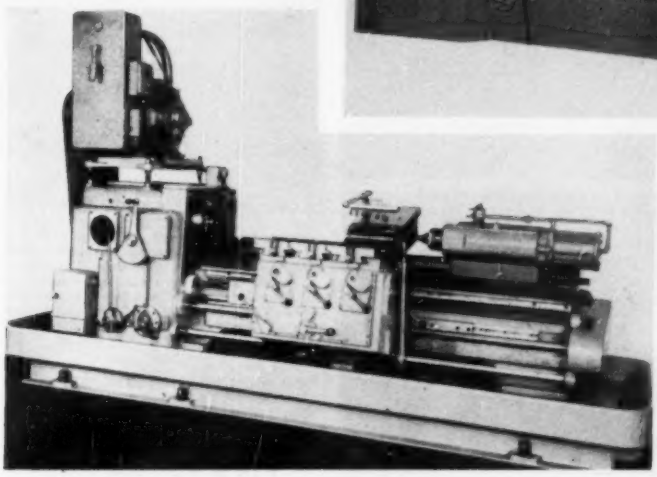
LATHE—*The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* Available with center distances starting at 48 inches and increasing in 24-in. increments, the LeBlond 20-in. hollow-spindle lathe has an 18-speed geared head stock and is arranged for 20-hp main-drive motor. It will swing 27 in. over ← bed and carriage wings.

LATHE—*Gisholt Machine Co., Madison 10, Wis.* No. 24 hydraulic automatic lathe is for heavy-duty work and swings 35½ in. over the bed ways. Standard equipment consists of front and rear carriages each with its own auxiliary slide. ↓



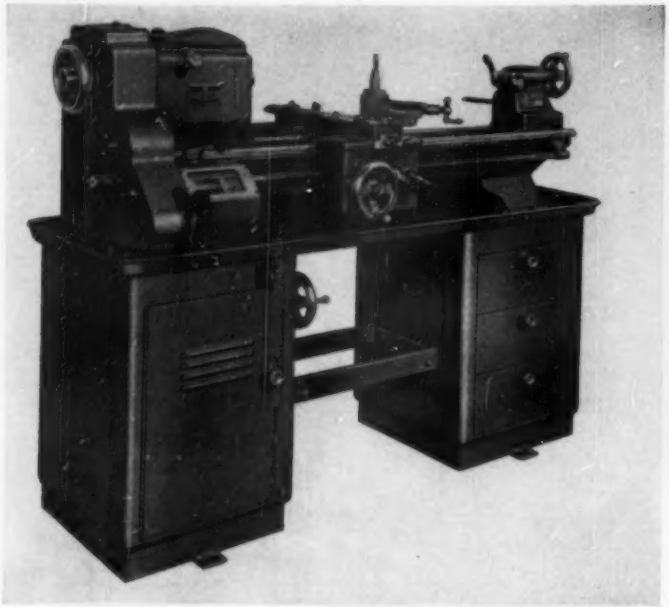
MICA UNDERCUTTER — *Frank N. Wood Co., 344 W. Main St., Waukesha, Wis.* The Trucut mica undercutter attachment is designed for use on general-purpose engine lathes. The unit is set up by merely replacing the lathe toolpost with the undercutter attachment.





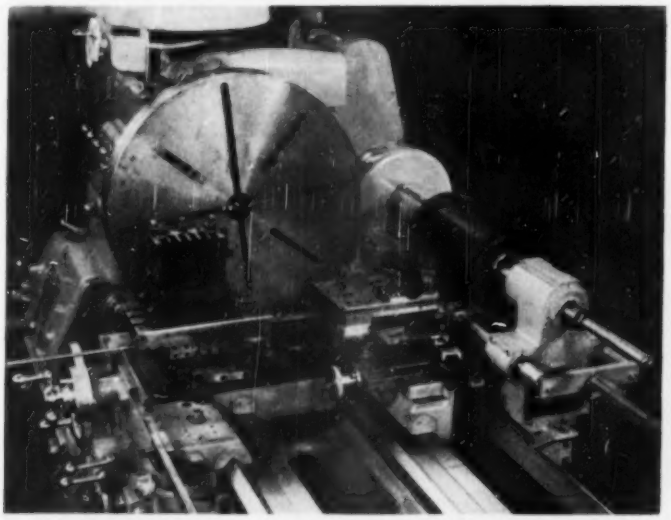
LATHE — *The Springfield Machine Tool Co., Springfield, Ohio.* A combination of quadrant gearing and a 60-feed gear box facilitates a quick changeover from standard operations to metric-, module- and diametral-pitch setups on the Springfield 16-in. Model S lathe. In addition the feed box includes all standard threads.

←
LATHE—*Seneca Falls Machine Co., Seneca Falls, N. Y.* Model AP high-speed multiple turning lathe, with unlimited carriage travel, is especially suited for shaft work. The multiple-slide front turning carriage operates on the rack-and-pinion feed principle.

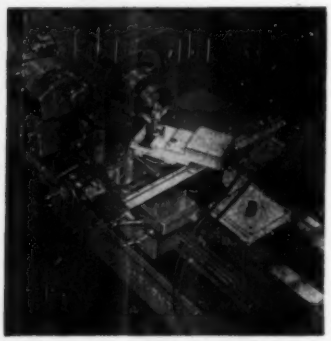


←LATHE—*Clausing Mfg. Co., Ottumwa, Iowa.* Series 200 12-in. Clausing lathe offers a tapered-nose key-drive spindle and infinite variation in spindle speed.

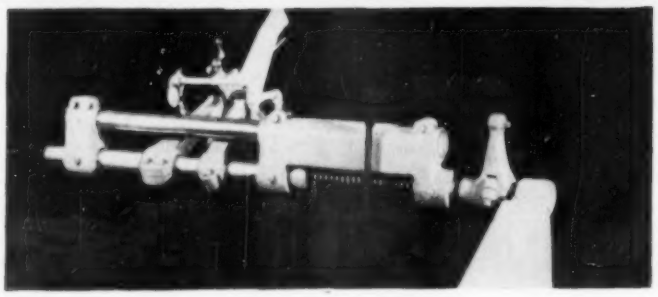
THREAD DIAL INDICATOR—*South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* The South Bend Metric thread dial indicator aids in cutting screw threads on lathes equipped with metric leadscrews.



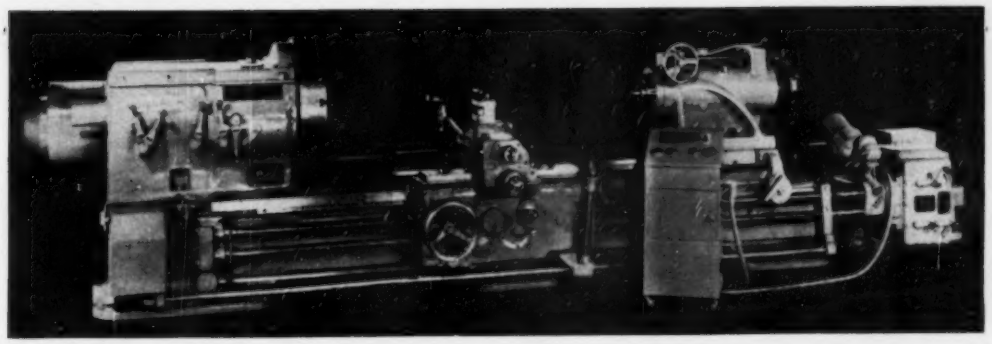
ENGRAVER—*The Monarch Machine Tool Co., Sidney, Ohio.* By removing the special-carriage cross-slide and substituting a conventional cross-slide and toolpost, the Shapemaster Engraver becomes a versatile engine lathe with a 26½-in. swing over the ←bed and 48 in. between centers.



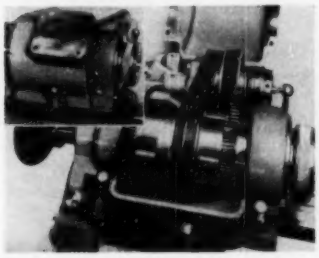
CONTOURING ATTACHMENT — *R. K. LeBlond Mach. Tool Co., Cincinnati 8, Ohio.* Hydraulic attachment for shaft and profile contouring can be installed in the field without drilling or fitting on LeBlond heavy-duty lathes. The "Hydra-Trace" accommodates stock to the full swing capacity of the lathe and does not interfere with cross-slide travel or prevent the use of the taper attachment.



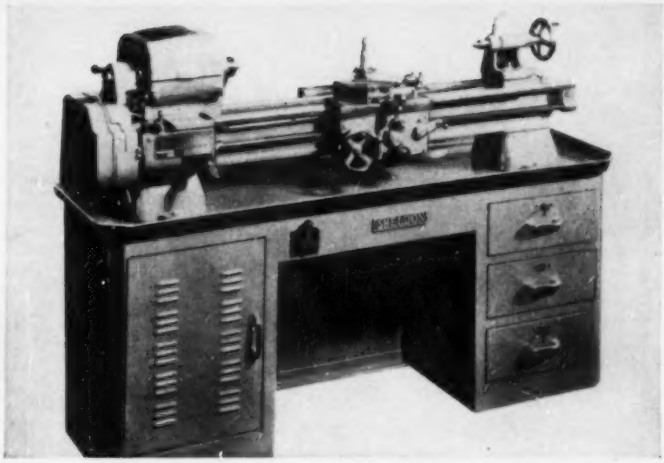
THREADING ATTACHMENT — *The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Mounted at the rear of the turret-lathe headstock, overhead threading attachment is said to speed single-point chasing operations in non-ferrous metals.←



ROLL-TURNING LATHE—*The Monarch Machine Tool Co., Sidney, Ohio.* Tracer-controlled contour turning is applied to steel-mill rolls, on the model NN 32-in.-swing lathe. Standard carbide tools contouring at speeds up to 110 sfpm replace the old HSS form tools and wedge-and-hammer feed in the new Monarch roll-turning lathe.

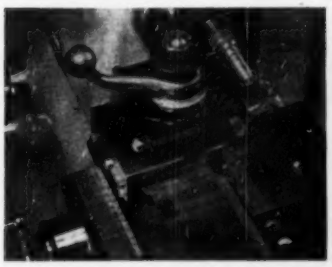


PRECISION LATHE—*The Wade Tool Co., Waltham, Mass.* A dual-drive system in the Wade Model 8A precision lathe gives the unit a spindle-speed range from 32 to 2000 rpm. With back gears engaged, stepless spindle speeds are from 32 to 220 rpm.



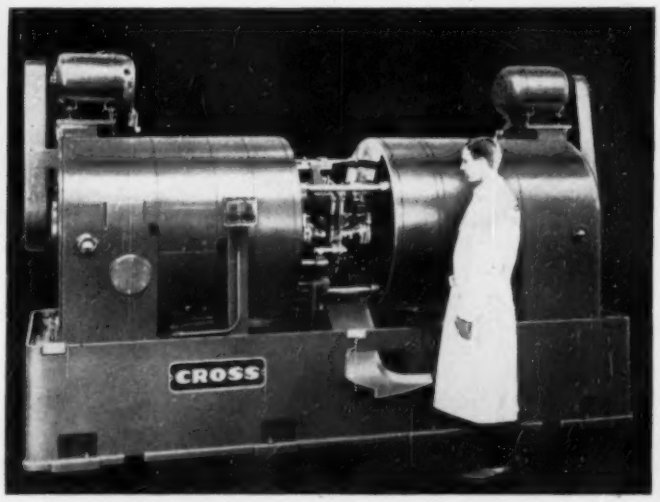
LATHE — *Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, Ill.* Designed to meet the need for lathes of large collet capacity, but requiring small floor spaces, this lathe has a 1⅝-in. hole through the spindle.

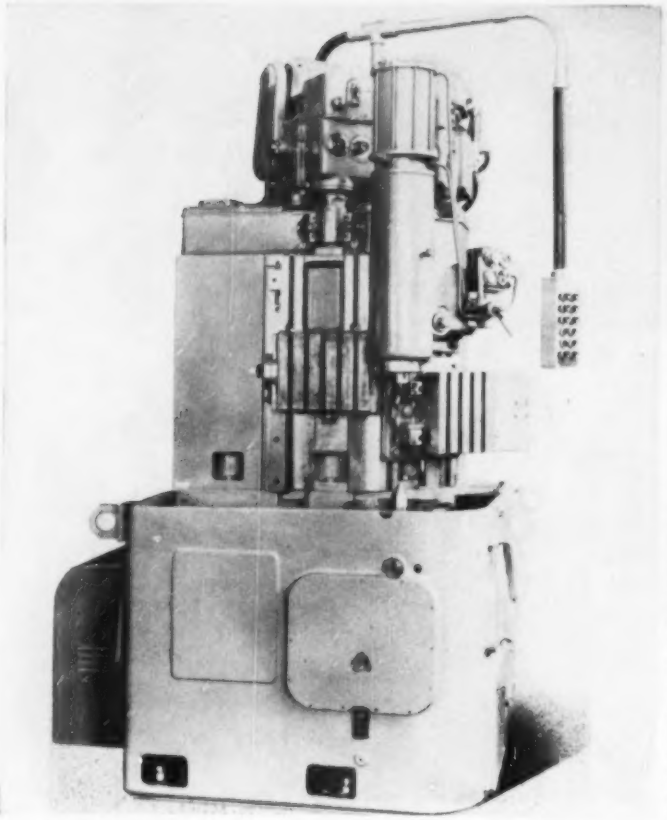
CHAMFERING MACHINE — *The Cross Co., Detroit 7, Mich.* Chamfering connecting rods at the rate of 1000 pieces per hr with one operator is possible with this special machine. Toolheads align work from main bore for concentricity.



INDEXING TURRET—*Hardinge Bros., Inc., Anderson St., Elmira, N. Y.* Automatic indexing square turret can be applied directly to the toolpost T-slot of the compound slide of the Hardinge precision lathe. The turret takes four standard 5/16-in.-square toolbits.

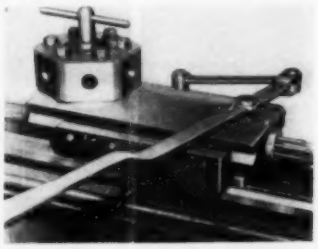
TURRET LATHE—*South Bend Lathe Works, South Bend 22, Ind.* Refinements in design have been incorporated in the post-war models of South Bend No. 2-H turret lathes. Included is a turret-locking mechanism which indexes turret head within ±0.0005 in. measured 4 in. from turret face.





VERTICAL LATHE — *Reed-Prentice Corp., Dept. V-15, Worcester 1, Mass.* Vertical automatic production lathe for turning, boring, and facing work, has been developed to take full advantage of high-speed negative-rake cutting tools. The unit is controlled by a central cycle timer.

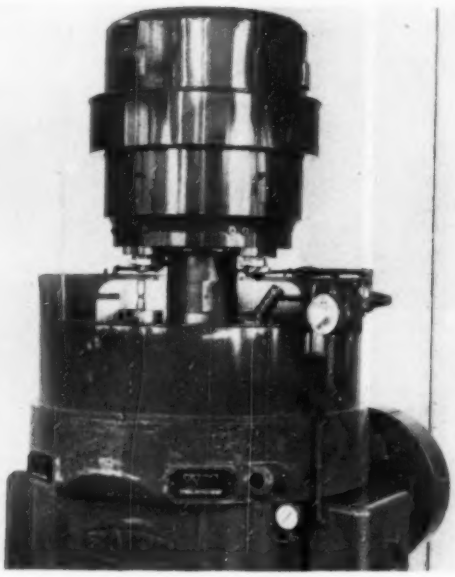
FIFTH-POSITION ATTACHMENT—*The Warner & Swasey Co., 701 Carnegie Ave., Cleveland 3, Ohio.* Independent attachment for Warner & Swasey five-spindle automatics permits a variety of cutting operations at the 5th longitudinal station during cutoff.

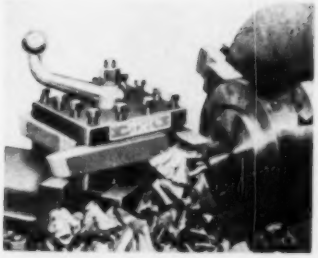


BED TURRET—*Enco Mfg. Co., 4522-2½ West Fullerton Ave., Chicago 39, Ill.* Adaptable to all lathes from 9- to 12-in. swing, the hand-lever Hex-turret can be furnished with 4½- or 6½-in. working travel.

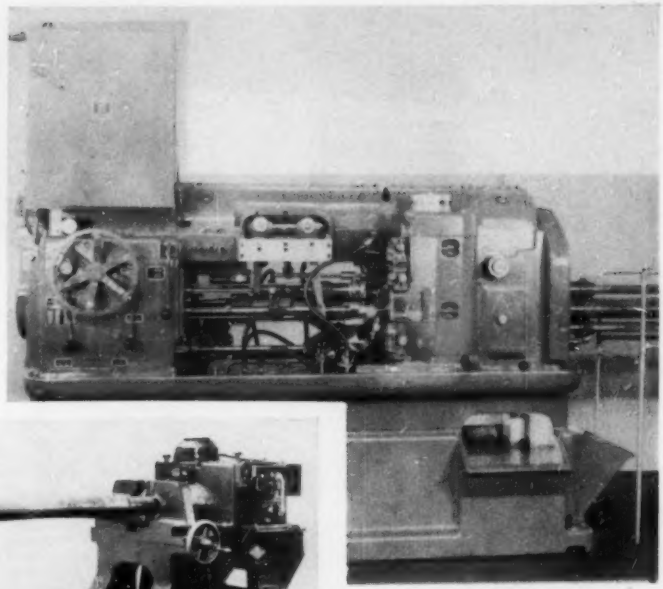
VERTICAL LATHE—*The Baird Machine Co., 1700 Stratford Ave., Stratford, Conn.* Operating continuously with work and tools rotating at 4 rpm, the Baird No. 4 vertical lathe can face and chamfer 900 pieces per hr.

LATHES — *Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill.* Logan 11-in. lathes offer a 1-in. collet capacity for draw-in collets and center distances of 24 and 36 in.

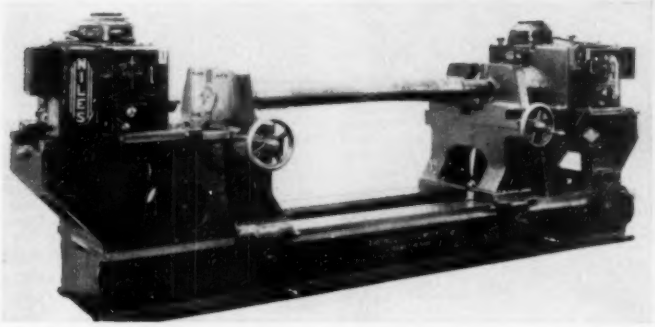




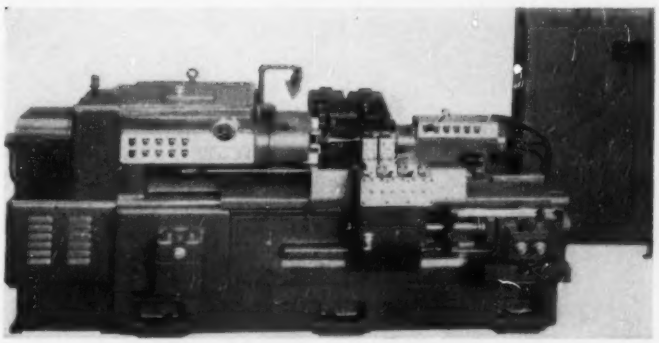
LATHE TURRETS — *Enco Mfg. Co., 4526 W. Fullerton Ave., Chicago 39, Ill.* Twelve-position indexing lathe turret allows use of standard tools without costly regrinding in addition to providing a quick set-up for threading.



AUTOMATIC LATHE — *Cone Automatic Machine Co., Windsor, Vt.* One-in. six-spindle Conomatic, Model SL, handles short, medium, and long runs of ferrous and non-ferrous material, with HSS or carbide tools. Flexible power-feed transmission offers selective feed combinations to 225, between 30 and 943 work-spindle revolutions.

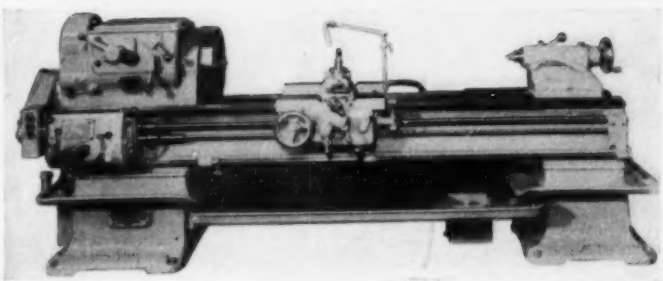


AXLE LATHE—*Nile Tool Works Co., Div. of the Lima-Hamilton Corp., Hamilton, Ohio.* Hydraulic-feed axle-centering machine both centers new axles and renews centers on either mounted or unmounted axles, prior to turning operations. It also checks wheels for concentricity of journals with reference to the periphery of the wheel.

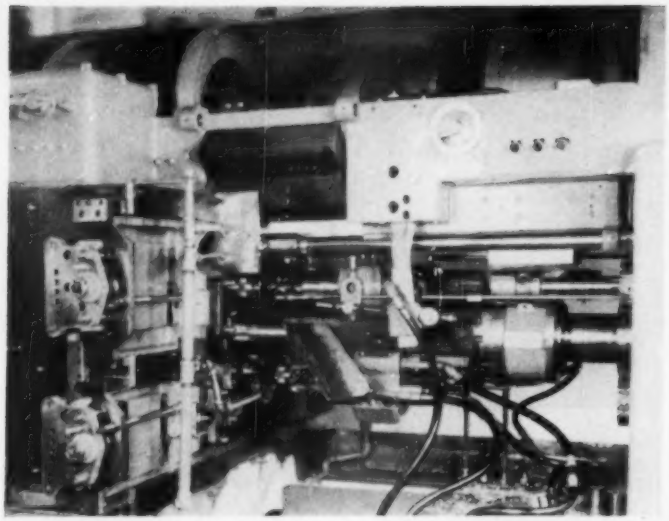


AUTOMATIC LATHE—*Morey Machinery Co., Inc., 410 Broome St., New York 13, N. Y.* Automatic lathe for high-production turning is hydraulically operated and electrically controlled. It is built in two models: DB, for work between centers, and CD, for chucking and fixture work. →

LATHE—*Snyder Tool & Engineering Co., Detroit, Mich.* Heavy-duty vertical hydraulic lathe was built for special application in the manufacture of car and truck components, but is adaptable to facing, boring, or turning by changing the fixtures and toolholders. Horizontal slide has 21-in. stroke, and vertical slide has 14-in. stroke.



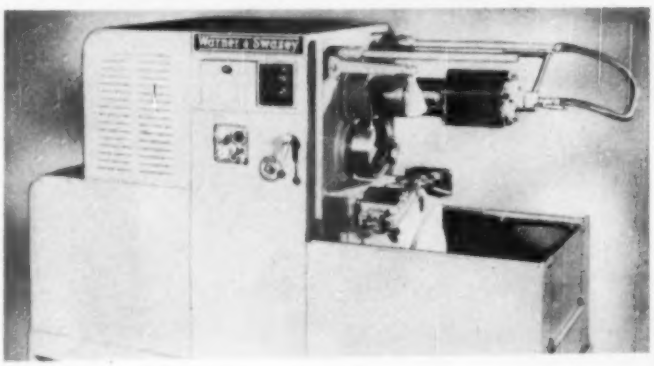
LATHES — *Springfield Machine Tool Co., Springfield, Ohio.* Springfield lathes are offered with 16 spindle speeds, increased horsepower capacities, and several optional speed ranges for coverage of work requiring slow speeds for heavy types, as well as high speeds for carbide tooling. →



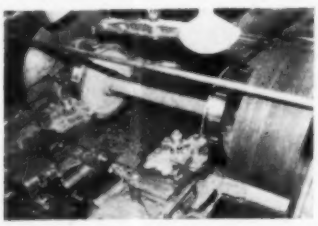
4-SPINDLE CONOMATIC—*Cone Automatic Machine Co., Inc., Windsor, Vt.* Heavy-duty 5-in. 4-spindle Conomatic Model KL is built to handle any size run; short, medium, or long. A wheel-operated stock feed with scale graduations provides instant setting. Working travel of the main end-slide is 4-in. max. and total is 10 in. Two end-working slides travel up to 10 in.

SCREW MACHINE—*Johnson Automatic Machine Co., Westfield, Mass.* Rapid changeover is accomplished by segment adjustment in automatic screw machine. No cams are involved. Cycle of operation varies from 1.5 to 60 sec.

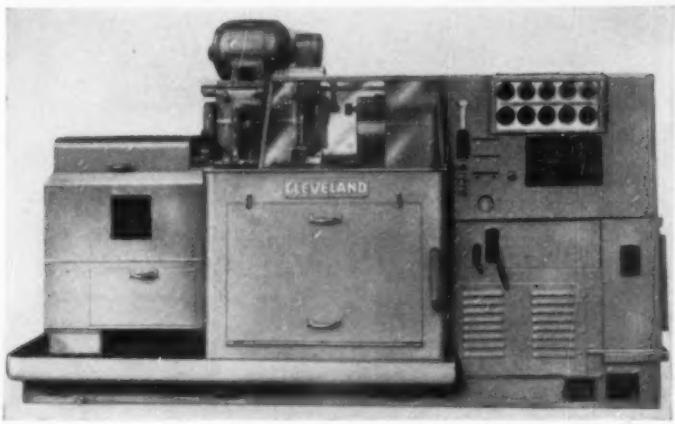
STOPS—*Boyar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* Two sizes of revolving stops are for use on turret lathes and large screw machines. Sizes are 4RS-1½-in. shank and 5RS-1¾-in. shank.



←
CHUCKING MACHINE—*Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Single-spindle automatic chucking machine features front and rear cross-slides and a five-faced overhead turret, handling work up to 8½ in. in dia and up to 6 in. turned length.



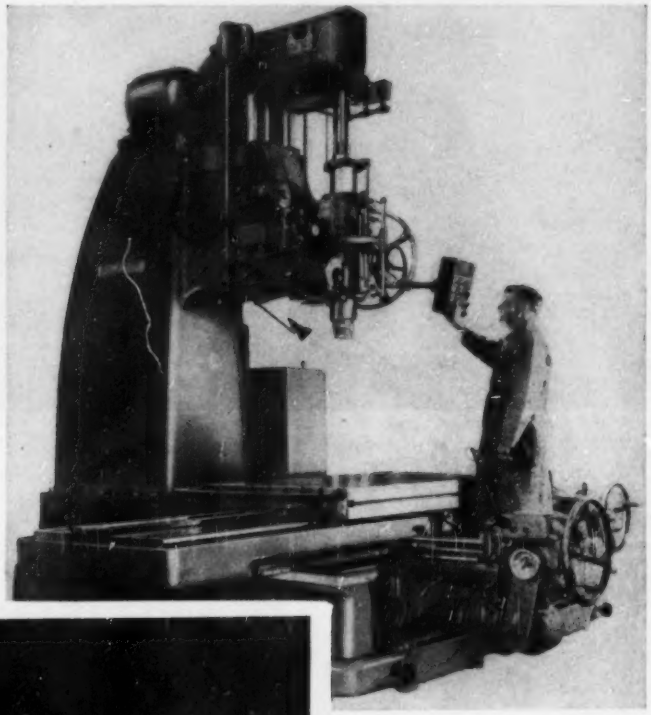
PROFILING ATTACHMENT — *Nile Tool Works of Lima-Hamilton Corp., Hamilton, Ohio.* Profiling attachment for car-wheel lathe produces up to 22 sets of wheels per day. Lathe with tread profiling attachment is a hydraulic device producing profile on wheel tread that is exact duplicate of templet.



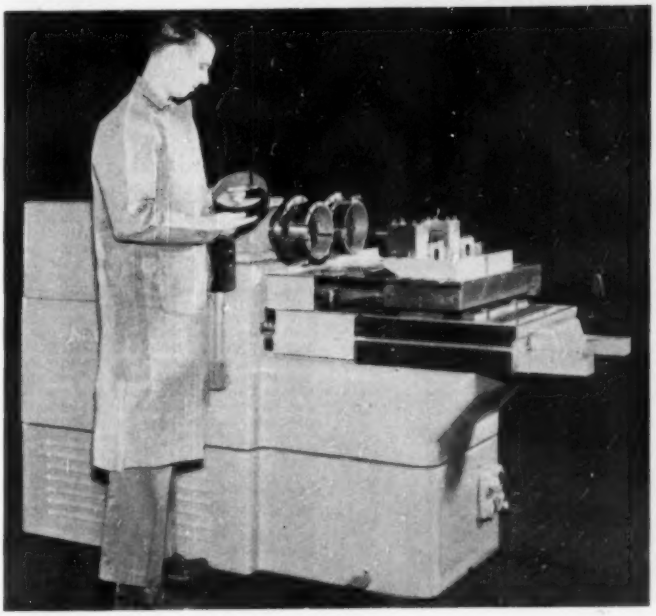
←
SCREW MACHINE—*Cleveland Automatic Machine Co., Cincinnati, Ohio.* The Dialmatic, Model AB, 2½-in. single-spindle automatic screw machine, offers a main guard which permits easy access to the tooling and facilitates chip removal.

Boring

JIG BORER—*Hauser Machine Tool Corp., Manhasset, N. Y.* Model 2BA precision jig borer offers centralized control. Capacity is 14x8 in. Readings are in 0.0001 in. and accuracy of slide locations is 0.00015 in.



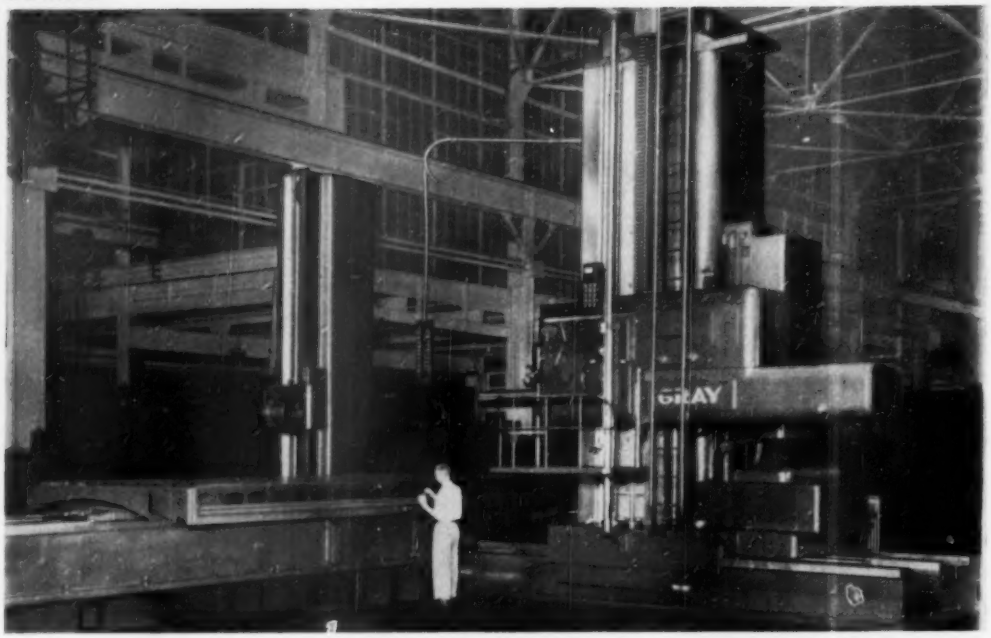
ACCURACY JIG BORER — *Pratt & Whitney, Div. of Niles-Bement-Pond Co., West Hartford, Conn.* Vertical jig borer is a 15-ton precision machine capable of locating and boring to 0.0001-in. accuracy with a work load of 2½ tons.



BORING HEAD—*Pearson Phillips Ltd., 194-96 Finchley Road, London, N. W. 3, England.* ABC boring head with radial offset has a ½- to 6-in. capacity. Head permits use of speeds to 1200 rpm in milling machines, drill-presses, or lathes.

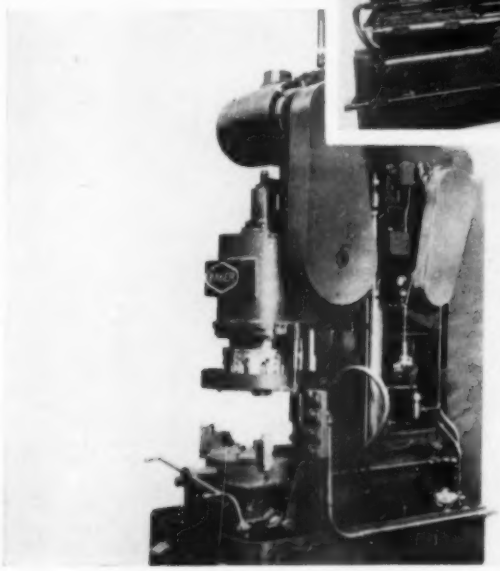
←

BORING MACHINE — *New Britain Machine Co., New Britain-Gridley Machine Div., New Britain, Conn.* Precision boring machine produces straight boring or turning, contour boring or turning, and facing with a cam-actuated single-point tool. Machine will continuously hold size to 0.0001 in. and has a top spindle speed of 7500 rpm.



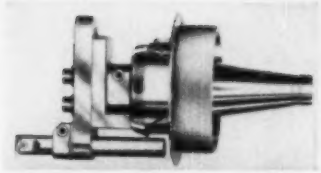
BORING MACHINE—*The G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.* A 9x20-ft table, capable of handling 80-ton loads, and an 8-in. dia x 12-ft Nitralloy boring bar driven by a 75-hp ac motor are features of this 8-in. planer-type horizontal boring, drilling, and milling machine. With continuous bar feed of 84 in. and column cross travel of 10 ft, a tool can be fed 17 ft horizontally or 12 ft vertically in this 175-ton unit.

BORING MACHINE — *LeMaire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich.* Two-way 42-spindle horizontal machine has a shuttle fixture to rough and finish bore large holes, face ends, drill and ream bolt holes from outside, and spot-face bolt holes from inside on an axle.



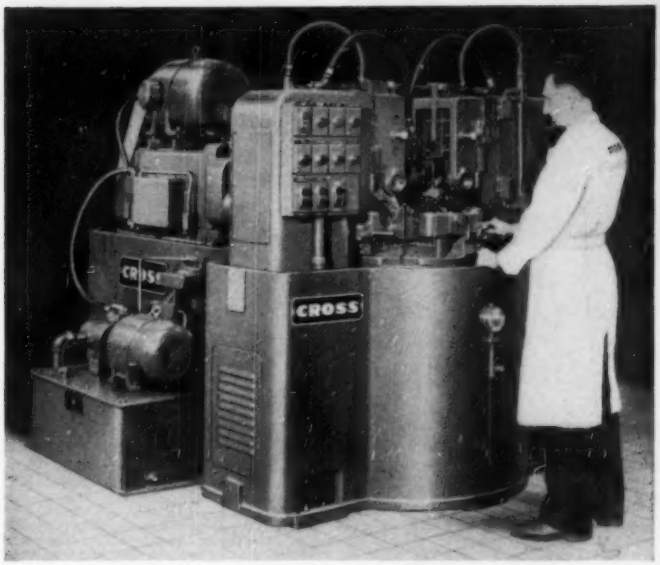
BORING, FACING MACHINE—*The Cross Co., Bellevue Ave., Detroit, Mich.* Special machine bores and faces three types of automotive-axle housings without changing the setup. One unskilled operator can process 280 parts per hr.

BORING MACHINE — *Baker Bros. Inc., Toledo, Ohio.* Equipped with Murchey special full-receding pipe taps, the Baker 30HO4 machine is reported to greatly reduce operating time in boring, reaming, threading, and counter-boring cast-iron pipe flanges.



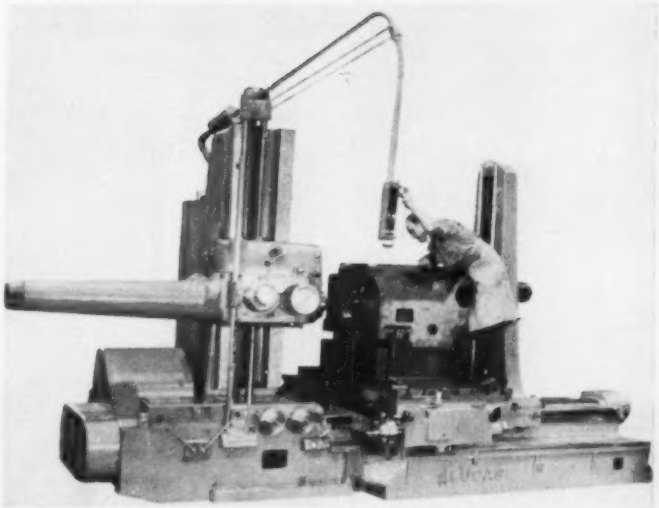
BORING HEAD — *Everede Tool Co., 2000-06 North Parkside Ave., Chicago 39, Ill.* Everede offset boring heads are manufactured in three sizes for use on any type boring machines or turret lathes. They are made of hardened-ground alloy tool steel.

SPECIAL - PURPOSE MACHINE—*Snyder Tool & Engineering Co., Detroit, Mich.* This unit processes 32 holes every 45 sec in a 6-cylinder cast-iron alloy block. High-speed steel tools are used at speeds ranging from 60 to 90 sfpm.



PRECISION MACHINES—*Lucas Machine Div., New Britain Machine Co., Cleveland, Ohio.* The Lucas precision horizontal boring, drilling, and milling machine is built in 3-, 4-, 5- and 6-in. spindle sizes in both electrically and mechanically controlled models.

BORING, FACING UNIT—*The Cross Co., Detroit, Mich.* Special machine with hydraulic feed automatically bores and faces side gear pockets of differential cases. Unit was designed to produce 100 pieces per hr at 100% efficiency.



BORING, FACING, GROOVING TOOLS—*Chandler Tool Co., 51½ Ohio Ave., Muncie, Ind.* Improved boring, facing, and grooving tools are available in six sizes with power-feed facing. The Model J is designed for small machines such as Moore, Index, and Bridgeport.

BORING—*Snyder Tool & Engineering Co., East Lafayette, Detroit, Mich.* This machine is for rough boring of railroad-car wheels and similar large forgings and castings. Tungsten-carbide tools remove 1 in. of stock from a 5¾-in.-dia pierced hole 7½ in. long in a steel car wheel.

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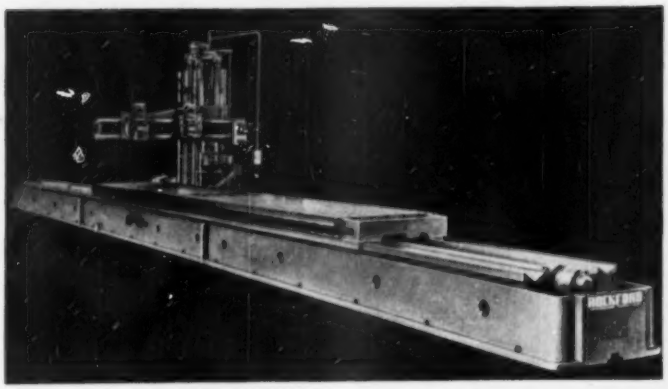
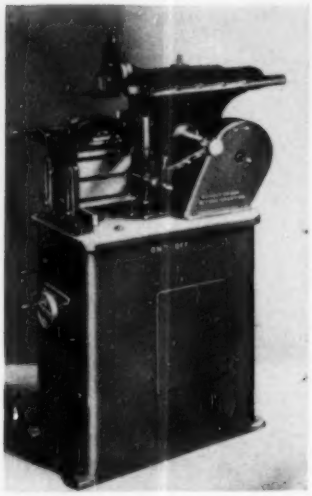
Planing and Shaping

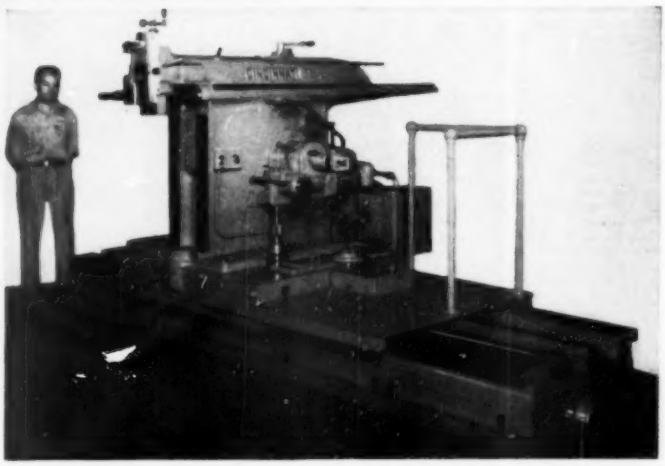


PLANER — *Rockford Machine Tool Co., Rockford, Ill.* A special hydraulic-cylinder assembly design is credited with making the 33-ft cutting stroke possible on this Rockford openside planer. The planer is 73 ft long over-all and about 14 ft high. ←

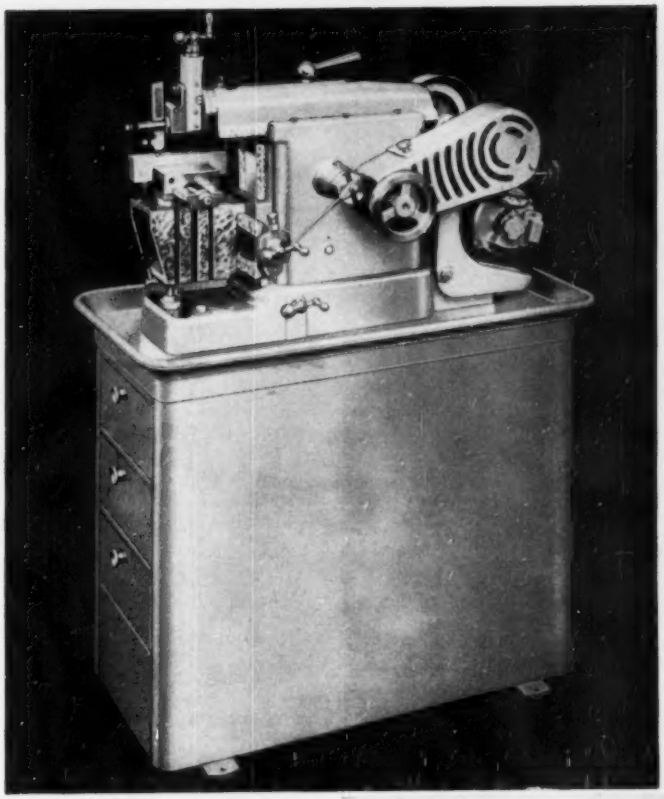


SHAPER — *The Logan Engineering Co., 4910 West Lawrence Ave., Chicago 30, Ill.* Logan 8-in. shaper has a powerful 8½-in. stroke max permitting full and accurate machining. Straight cuts, angular cuts, squaring, machining, and slotting are handled.

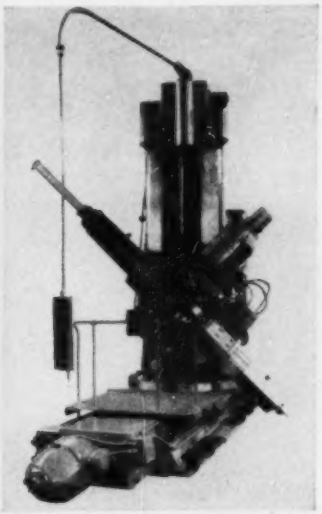
SHAPER — *Smith & Mills Co., Div. Hamilton-Thomas Corp., Cincinnati 25, Ohio.* Special 32-in. shaper was built to shape top and recess both ends of a large semi-steel casting in one setup.



SHAPER — *The Cincinnati Shaper Co., Cincinnati, Ohio.* Employing the boring-mill travel method, this machine can shape a surface requiring up to 8-ft table travel without need for resetting the workpiece. Ram speeds are from 8 to 102 strokes per min. →



SHAPER—*South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* Seven-in. bench shaper for toolroom and industrial use has main castings made of close-grained semi-steel. The ram and table slides are milled and hand-scraped for precision fit and are provided with adjustable gibs. Vise jaws are 4 in. wide, 1 in. deep, and open to 4 in.

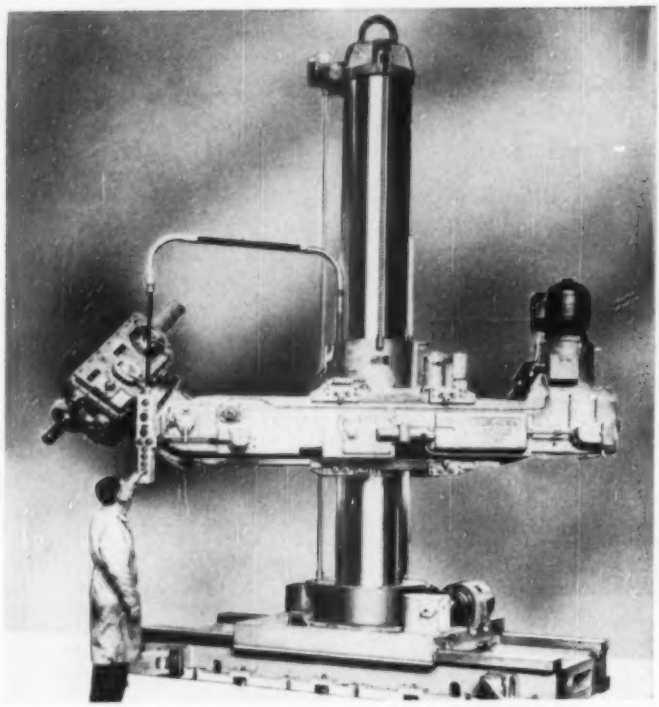


PLANER—*Morton Mfg. Co., Broadway and Hoyt, Muskegon Heights, Mich.* Universal traveling-head planer is arranged for shaping, planing, and slotting only. The machine has a 65-in. cutting stroke with 48-in. vertical feed.

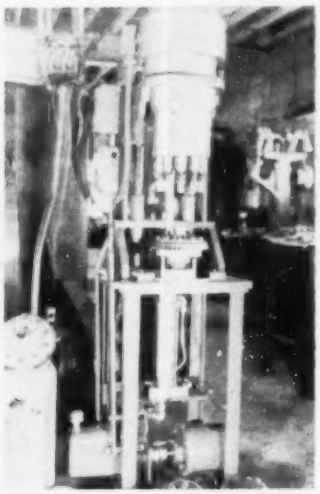
SHAPERS—*The Cincinnati Shaper Co., Cincinnati 25, Ohio.* Utility shaper provides table supported directly on the cross rail without an apron, and is heavy enough to take the full load without table support. Cutting speeds over 250 fpm are possible on a 10-in. stroke.

AMERICAN MACHINIST 37TH ANNUAL REVIEW

Drilling

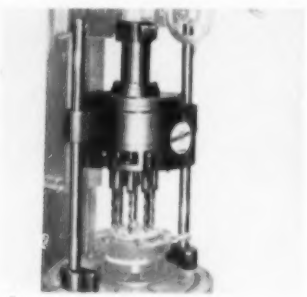


DRILLING MACHINE — *Kaukauna Machine Corp., Kaukauna, Wis.* Capable of performing radial, horizontal, or angular operations such as drilling, tapping, boring, spot-facing, or reaming on a production basis, this heavy-duty full-universal Kaukauna drilling and tapping machine provides a 97-in. radial reach with the spindle in vertical position.

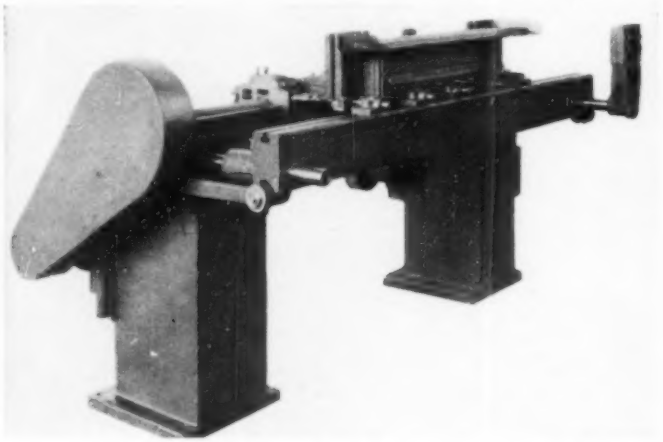


AUTOMATIC RELEASE—*Clyde Tool Co., 1104 E. Eleven Mile Road, Route 4, Box 438-A, Royal Oak, Mich.* Tru Tork cam-type automatic release clutch for single- and multiple-spindle heads is adaptable as a nut runner or setter. Desired torque can be preset.

DRILLING MACHINE—*Moline Tool Co., Moline, Ill.* Special drilling machine, Model SLD400, for slat drilling is an adaption of the Moline spiral drive for in-line spindles to the drilling and counterboring of wooden slats. Holes are drilled for rivets.



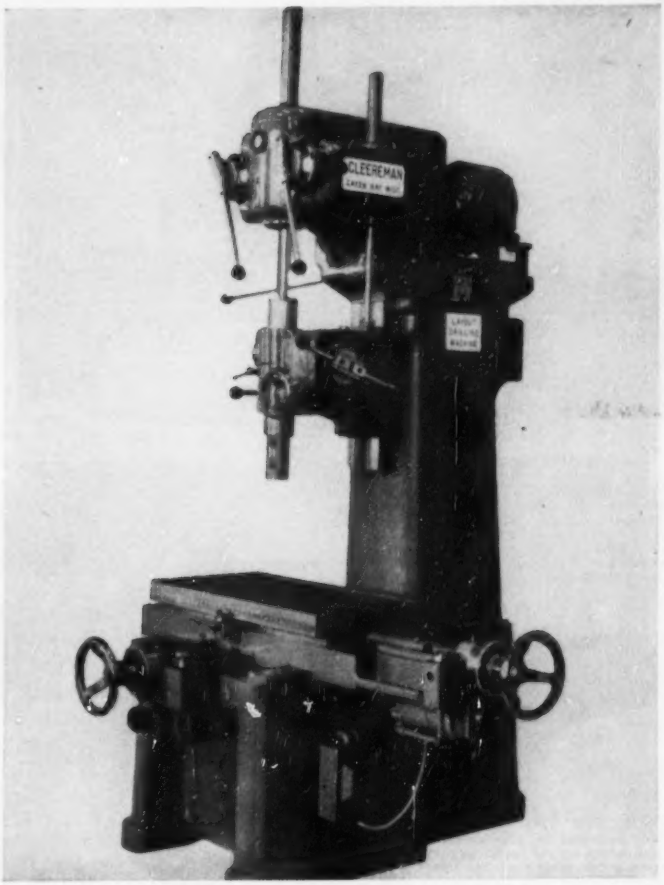
DRILLHEAD—*U. S. Drill Head Co., 616 Burns St., Cincinnati 4, Ohio.* Adjustafix multiple-spindle drillhead is for drilling, tapping, reaming, spotfacing, boring, counterboring, and milling operations. The number of drill patterns possible is limited only by the number of pattern plates available.



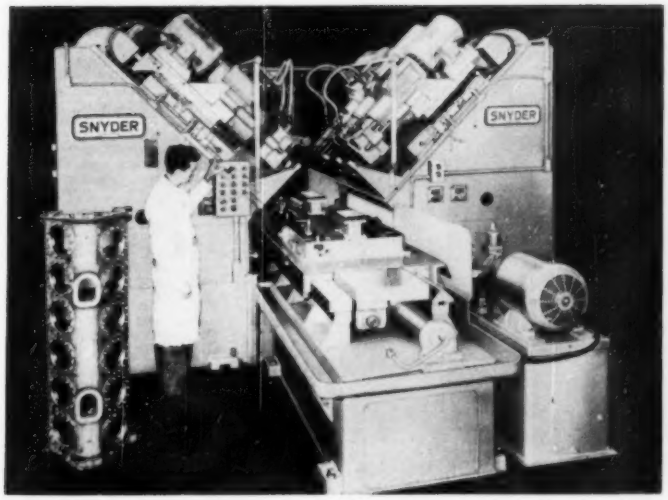
DRILLPRESS—*Famco Machine Co., Racine, Wis.* Spindle speeds for this drillpress range from 625 to 4800 rpm in standard models and from 490 to 3000 rpm on Slo-Speed Models. Speed-reducing attachment facilitates spindle speeds as low as 185 rpm.

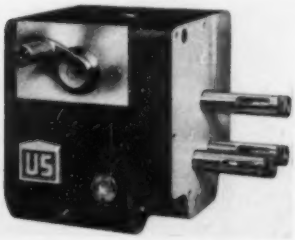
DRILLING—*Govro-Nelson Co., Detroit, Mich.* Incorporating drilling and tapping units, this special machine performs several operations at once. It is designed to drill, chamfer, tap-drill, and tap the hole for the adjusting worm of a wrench at rate of 5 sec per wrench.

DRILL — *Snyder Tool & Engineering Co., Detroit, Mich.* Eleven-station line-index hydraulic-feed machine drills, counterbores, and taps 168 cylinder stud holes at a 90° angle in large aluminum crankcases. Cycle time is 2 min 19 sec, without loading and unloading.

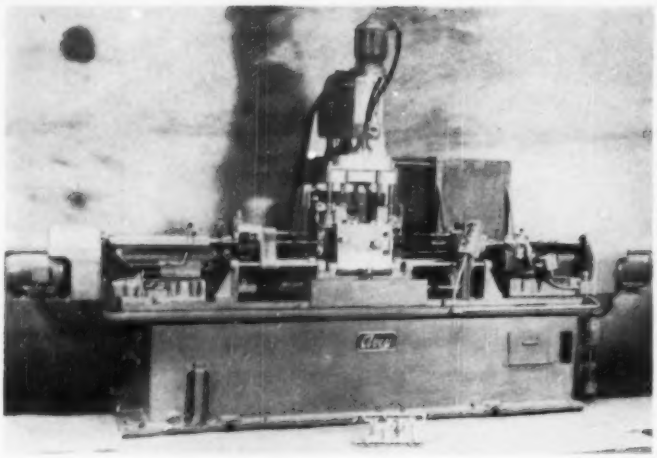


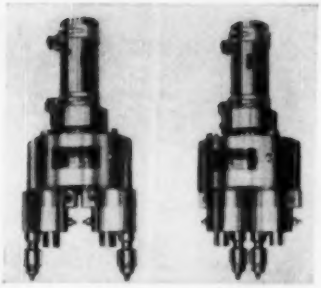
DRILLING MACHINE — *Cleereman Machine Tool Co., Green Bay, Wis.* Cleereman layout drilling machine is for handling work requiring more accuracy than is possible with a drilling machine but not requiring the extreme precision of jig borer.





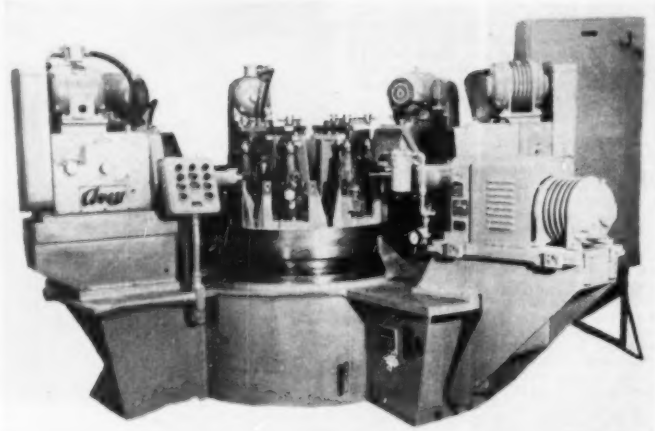
DRILLHEAD—*U. S. Drill Head Co., Cincinnati 4, Ohio.* Built to give machining of different materials correct peripheral speed on drills, taps, and reamers from a single-speed drive unit, this multiple-spindle drillhead is oil lubricated and has a maximum recommended speed of 15,000 rpm.



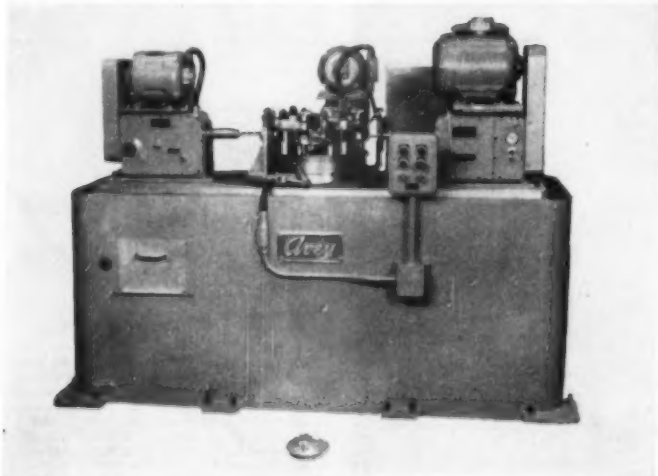


DRILLHEAD—*Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y.* Adjustable drillhead can be supplied with two spindles, with three spindles for equal adjustment in line, and 3, 4, 5, or 6 spindles for equal adjustment on bolt circles.

DRILLING MACHINE—*Avey Drilling Machine Co. Inc., Cincinnati 1, Ohio.* Special multiple-spindle machine incorporates standard hydraulic and cam-feed drilling units with multiple-spindle U.S. drillheads attached for multiple-drilling operations.



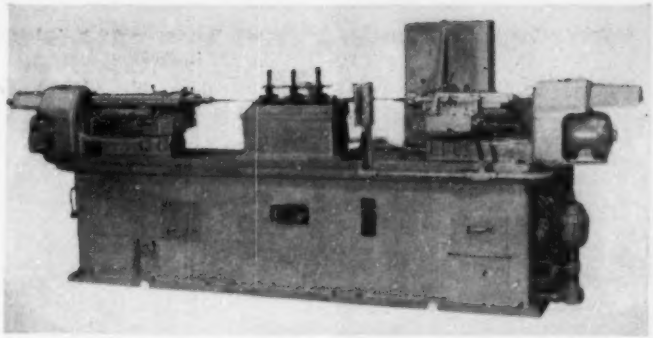
DRILLING UNIT—*Black Industries, 1400 E. 222nd St., Cleveland, Ohio.* This unit has a single rotating member, and uses a traversing motor shaft for the work spindle. The micrometer stop insures depth-drilling accuracy to within 0.001 in.



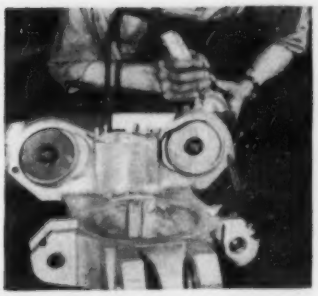
DRILLING AND TAPPING MACHINES—*The Avey Drilling Machine Co., Cincinnati 1, Ohio.* Automatic-index drilling and tapping machines incorporates 5 No. 2 Avey cam-feed units plus a U.S. leadscrew tapping unit, all mounted horizontally around a seven-station automatic-indexing table. The machine performs multiple drilling, reaming, and tapping operations on automotive overdrive housings.

ACOUSTICAL-TILE DRILLER ← *Zagar Tool, Inc., 25880 Lakeland Blvd., Cleveland 23, Ohio.* Acoustical-tile drilling machine drills simultaneously all the holes in a 12x12-in. acoustical tile.

← DRILLING MACHINE — *The Avey Drilling Machine Co., P. O. Box 625, Cincinnati 1, Ohio.* Special machine for drilling, spot facing, and tapping automotive gear-shift housings consists of three Avey cam-feed units mounted horizontally on a steel base. Operations include 0.5-in. drill, 1.312 spotface and countersink, and 0.562-18-in. tap.



DRILLING MACHINE—*The Avey Drilling Machine Co., Cincinnati 1, Ohio.* Drilling machine was designed to drill a deep hole 0.219 in. in diameter through a transmission shaft 18 in. long with a maximum run-out of approximately 0.012. Production is approximately 12 to 15 transmission shafts per hr.



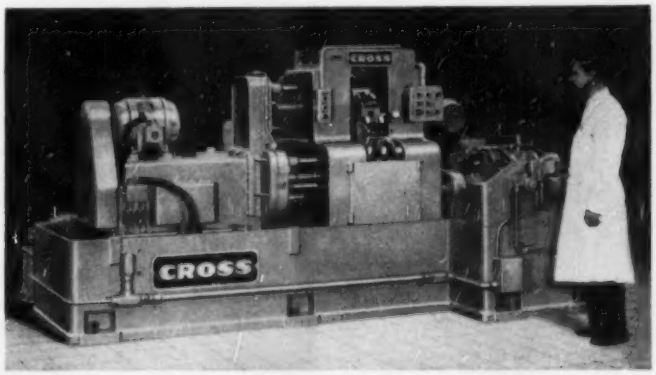
HALF-HOLE DRILLING—*Texas Engineering and Mfg. Co., Inc., P. O. Box 6191, Dallas 2, Texas.* Formerly rasped out with a file, half holes can now be drilled by use of a special half-hole drill jig.

DRILL—*Cross Co., Detroit 7, Mich.* Special machine drills, countersinks, and reams five holes in the flanges of automobile rear-axle shafts at the rate of 255 pieces per hr.

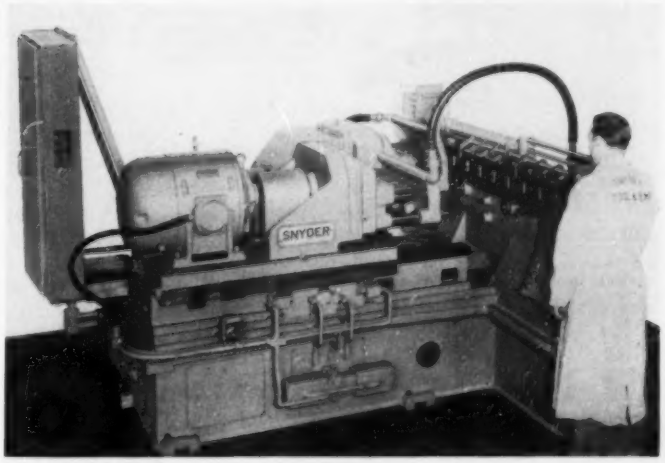
ADJUSTABLE DRILLHEAD — *The Thriftmaster Products Corp., Lancaster, Pa.* Model U620B universal joint-type adjustable drillhead for close center drilling is adjustable to 11/16-in. minimum center distance on any pattern within a 6⅝-in. circle.

DRILLPRESS ATTACHMENT—*Balfre Gear & Mfg. Co., 4711-17 W. Lake St., Chicago 44, Ill.* The Turnbug is an attachment for doing turning and boring work on a drillpress. It is built for precision work and is easily fastened to any drillpress table.

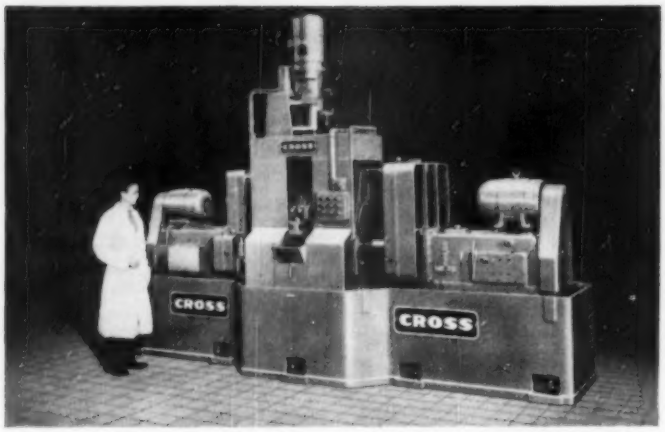
MULTI-PURPOSE DRILLER — *Snyder Tool & Engineering Co., Detroit, Mich.* Automatic-cycling machine for drilling, countersinking, rough boring, and semi-finish reaming automotive transmission parts is mounted on a welded-steel base, thoroughly normalized for rigidity. Floor space required is 81 x 174 in.



FINISHING—*The Cross Co., Detroit, Mich.* Special machine tool for finishing refrigerator crankshafts completes five drilling and two milling operations on 145 crankshafts per hr with only one unskilled operator.

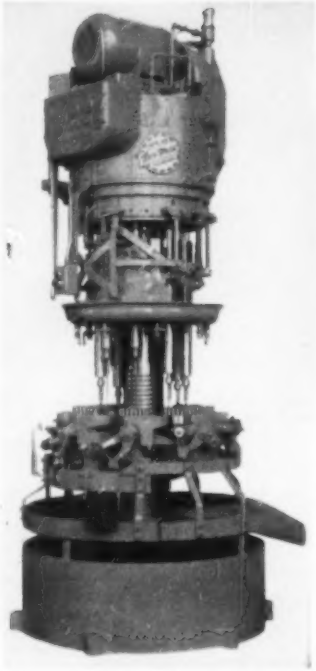


DRILLING MACHINE—*Snyder Tool & Engineering Co., E. Lafayette, Detroit, Mich.* Drilling, countersinking, and tapping machine cuts work cycle to 16 sec on processing automotive upper control-arm assemblies.

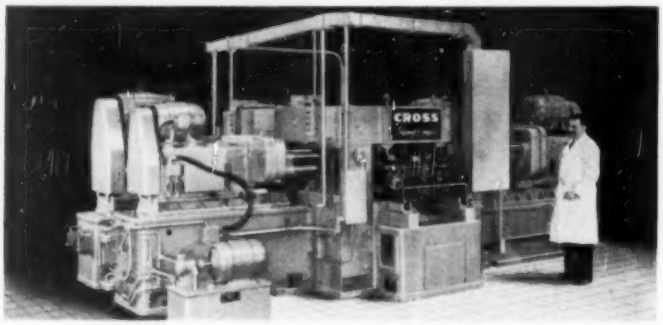


DRILLER—*The Cross Co., Detroit 1, Mich.* Special unit for machining axle shift forks performs 12 different operations on 87 pieces per hr, run by one unskilled operator. Four stations are provided.

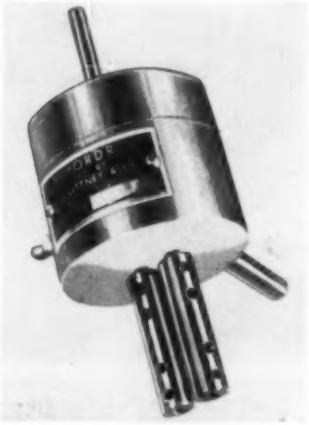
DRILLPRESS—*Cobb Precision Co., 6664 Lexington Ave., Hollywood 38, Calif.* Six-in. drillpress, taking drills from No. 0 to 5/32 in., uses a standard Jacobs chuck. Adjustable clearance from chuck to fixed table base is 0 to 7 in.



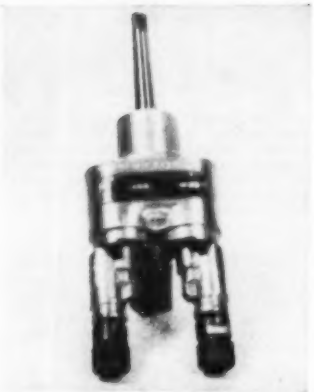
DRILLER—*Davis and Thompson Co., 6511 W. Burnham St., Milwaukee 14, Wis.* Vertical driller is adapted for reaming two sizes of intake- and exhaust-valve guides, the larger of which is 3½ in. long and has a 5/16-in. hole.



DRILL—*The Cross Co., Detroit 7, Mich.* Special "Transfermatic" machine performs 45 individual finishing operations on cylinder blocks while run by one unskilled operator.

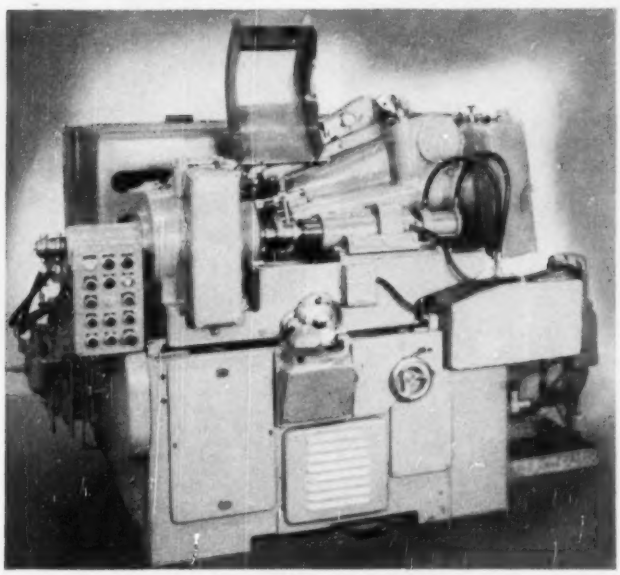


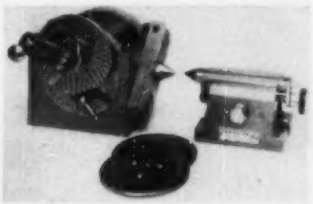
DRILL UNIT—*L. E. Ottney & Co., 3650 W. Eleven Mile Rd., Box 469, Royal Oak, Mich.* The Taperdril is a high-speed driving unit for drilling or tapping two or more holes on close-center work. It is installed in a drill chuck or tapping attachment.



DRILLHEADS—*Aiman's Machine Tool Engineering Co., 109 So. Broadway, Pendleton, Ind.* Adjustable drillhead makes a multiple-spindle drillpress of any make of drill unit. The drillhead is built with either a straight-shank driveshaft or a No. 1 Morse taper driveshaft.

Gear Cutting and Finishing





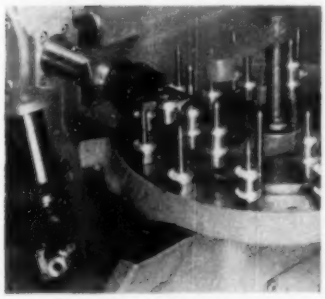
DIVIDING HEAD—*Marvin Machine Products Inc., 414 Ford Building, Detroit 26, Mich.* For dividing operations required in gear cutting, layout, splines, fluting taps or reamers, cams, hex screws, and squaring shafts, this unit comes complete with three index plates, each having six sets of holes.

GEAR HOBBER—*Hamilton Tool Co., Hanover at Ninth, Hamilton, Ohio.* The Hamilton No. 1 gear hobber hobs small spur, spiral, and bevel gears on fast production schedules, and handles work from 0.050 to 6 in. OD.

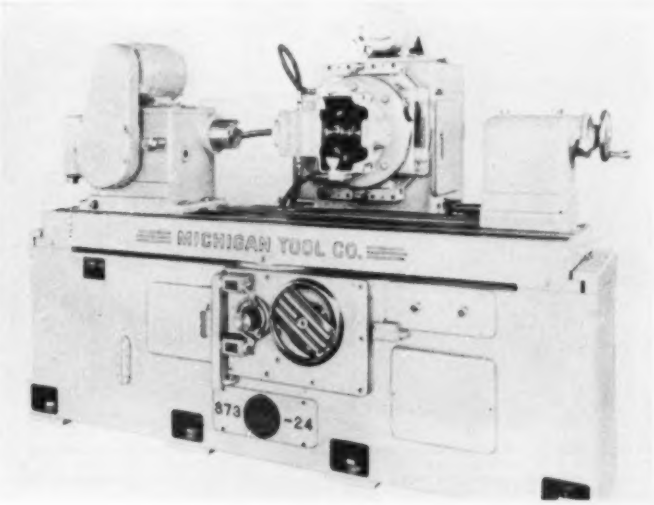
GEAR FINISHER—*The Fellows Gear Shaper Co., Springfield, Vt.* By cross-axes cutting with helicoidal-shaped teeth, this cutter finishes both sides of spur or helical gears in one traverse. When gear is completed the machine stops automatically.

GEAR FINISHER—*Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.* Model 873 is a high-production cross-axis rotary gear finisher. Completely automatic, the machine will handle spur or helical gears and involute splines from 0- to 24-in. dia and up to 15-in. face width. ↓

GEAR MACHINE—*National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Model GCU diagonal-gear shaving machine and automatic loader is shaving a 32-tooth constant-mesh transmission gear at the end of a cluster. At 85% efficiency, 191 gears are processed per hr.



AUTOMATIC WORK LOADER — *Gleason Works, 1000 University Ave., Rochester, N. Y.* Gear blanks from ¼- to 1½-in. dia can be cut on Gleason No. 2 straight-bevel and hypoid gear generators at 95% efficiency, through specification of an automatic work loader on new equipment or by returning standard machines to the factory to be fitted with device.



Tapping and Threading

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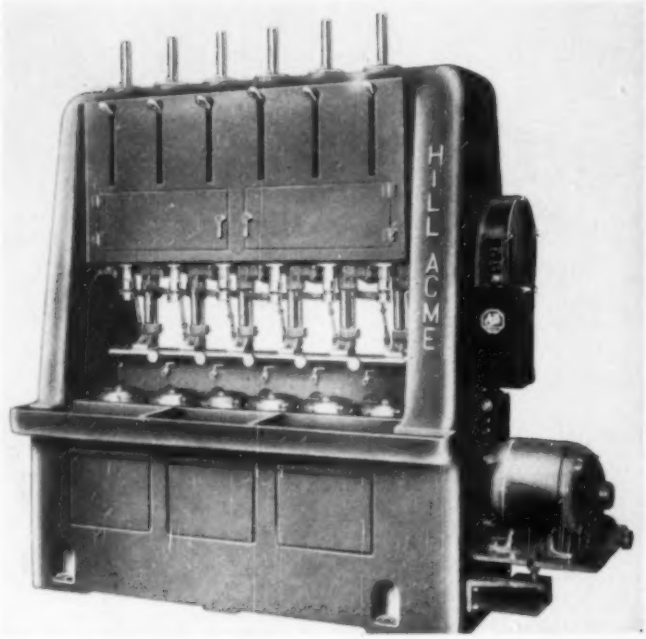
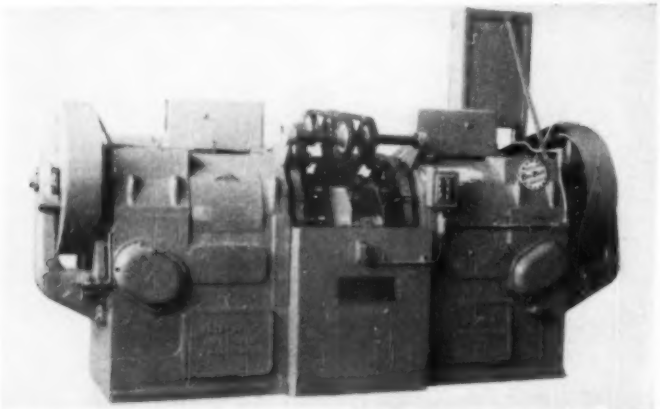
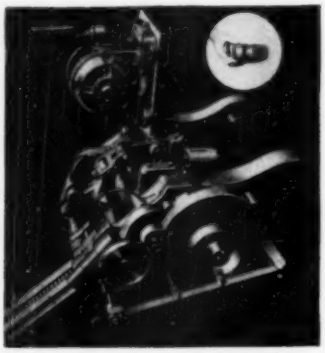


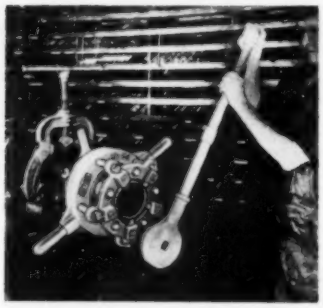
TAPPING MACHINE—*Acme Machinery Div., Hill-Acme Co., 4533 St. Clair Ave., Cleveland, Ohio.* Semi-automatic tapping machine will tap couplings or nuts. It is built in 6- and 8-spindle models and standard sizes of 1 and 2 in. Larger sizes are built in 4- or 6-spindle design.



HORIZONTAL THREADER—*Davis & Thompson Co., Milwaukee 14, Wis.* Twelve spindles provided with lead-screw feed, carrying 6 dieheads on each end, facilitate continuous threading of work pieces from both ends on the Rotomatic Type-GG double-end horizontal threading machine.

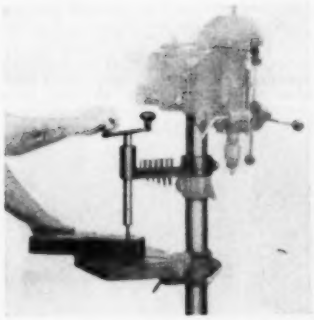


THREADER—*V & O Press Co., Div. Rockwell Mfg. Co., Hudson, N.Y.* The Rockwell No. 302 threading and trimming machine, in addition to threading and trimming, can also be utilized for beading, knurling, and curling either as separate operations or in combination.

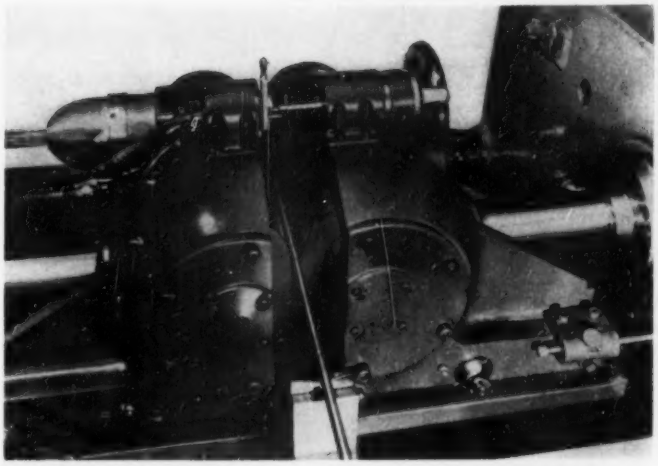


PIPE-THREADER—*Oster Mfg. Co., 2057 E. 61st St., Cleveland 3, Ohio.* Pipe-threading tool No. 54 is built to withstand the strain of power operation, or can be operated by hand with a ratchet handle. It can handle 2½-, 3-, 3½-, and 4-in. pipe.

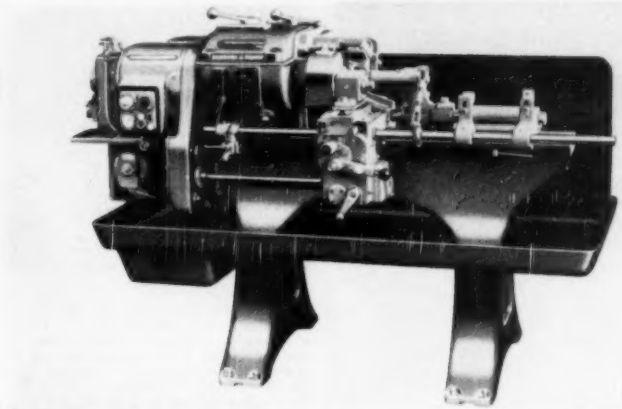
TAPPING UNIT—*Black Drill Co., Div. of Black Industries, 1500 E 222nd St., Cleveland 17, Ohio.* The rotor of this air-operated tapping unit shifts for the full length of the stroke so that the motor shaft can be made solid providing for extreme rigidity and accuracy.



TAPPING UNIT — *Paragon Metal Products, 416 So. Broadway, Los Angeles 13, Calif.* Said to both eliminate tap breakage and to speed up tapping in the toolroom and die shop, this Paragon hand-tapping machine can be mounted on the drillpress column as a permanent fixture in a few minutes.

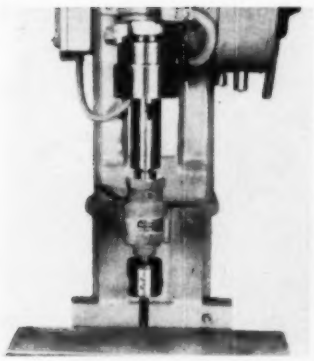


ROLLER—*Watson-Flagg Machine Co., 845 E. 25th St., Paterson 3, N. J.* A heavy-duty precision thread roller, Model C, will roll continuous threads, knurls, or serrations, taking diameters from 0.138 to 4 in. with a maximum of 8 pitch.

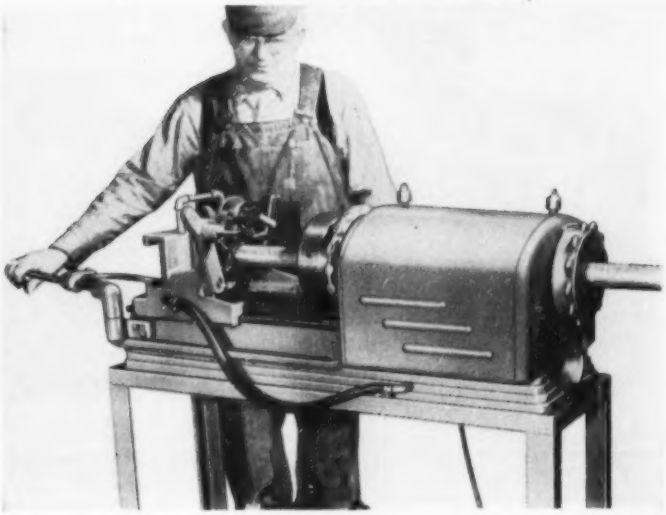


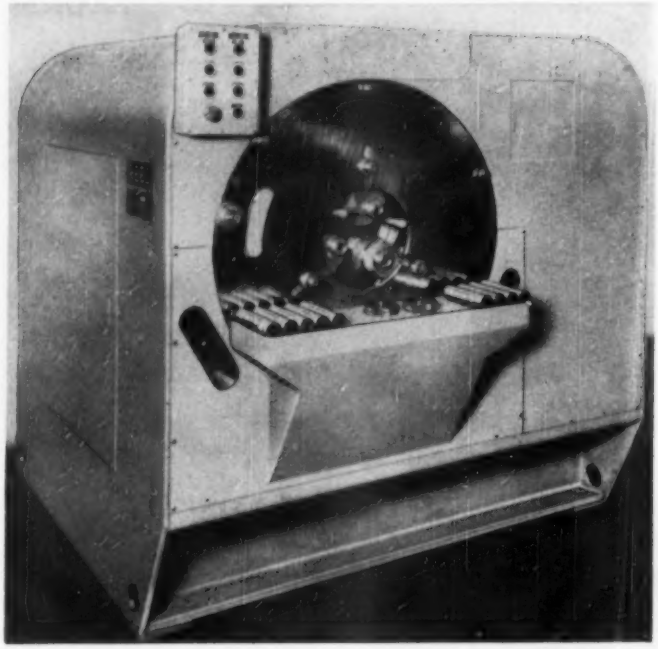
NIPPLE-MAKING MACHINE — *Bardons & Oliver, Inc., 1133 W. 9th St., Cleveland 13, Ohio.* Cutting and chamfering both ends, this fully mechanical automatic nipple-making machine produces 98 pieces of smaller size nipple stock per min, and up to 25 pieces of ← 1½-in. size per min.

THREADER—*Peerless Machine Co., 1600 Junction Ave., Racine, Wis.* The Peerless Threadfast machine can cut, ream, or thread pipe to 2-in. dia and thread solid rounds to 1¼-in. dia. It is equipped with a Roto-Lok wrenchless chuck which is a rapid-acting rotary vise designed to instantly grip and release the work.

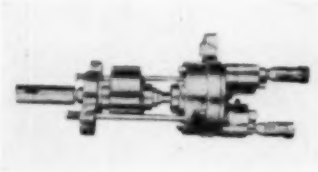


REVERSE-TAPPING UNIT—*Dorman Machine Tool Works, 38 South MacQuesten Parkway, Mount Vernon, N. Y.* High-speed wide-range automatic-reverse tapping attachment has full ball-bearing construction. Model is 3½x5½x9 in., weighs 11 lb.

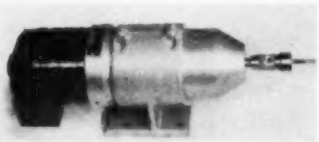




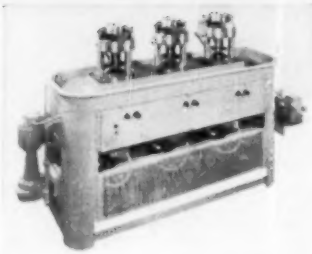
THREAD-ROLLING MACHINE — *Reed Rolled Thread Die Co., Worcester, Mass.* The Reed Model A22 and A23 cylindrical-die thread-rolling machines may be supplied with either manual or semi-automatic feeds suitable for rolling 1/16- to 2-in. pipe threads from 300 to 1500 per hr.



TAPPING HEAD—*Errington Mechanical Laboratory Inc., Staten Island 4, N. Y.* Adjustable tapping head permits wide range of adjustment without overhang. It is fully geared with needle bearings on all spindles.



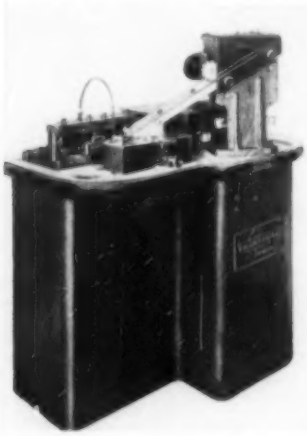
DIE THREAD ROLLER—*Reed Rolled Thread Die Co., 227 Chandler St., Worcester 2, Mass.* The Model A22 horizontal cylindrical die thread roller handles thread rolling to 4-in. dia threads. It supports the work blank horizontally between three synchronously rotating cylindrical dies.



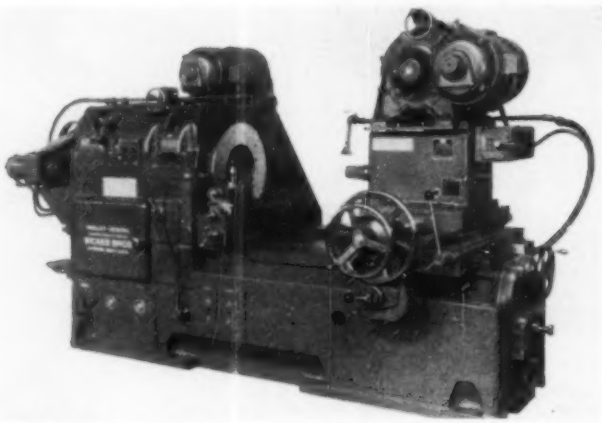
TAPPING UNIT—*Precision Thread Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Tapping unit has automatic forward and reverse movement of tap or external threading die, and can be mounted in any position and operated from remote electrical controls.

TAPPING MACHINE—*Cross Co., Detroit 7, Mich.* Multiple-spindle tapping machine taps the pan rail and ends of 130 cylinder blocks per hr at 100% efficiency. Four stations are provided.

TAPPING MACHINE—*D. H. Prutton Machinery & Tool Co., 5295 West 130 St., Cleveland, Ohio.* Adaptable for use of collapsible taps ranging in size from 1¼ to 4 in., the Tapmaster No. 40, machines the bottom surface of the work ← during the tapping cycle.

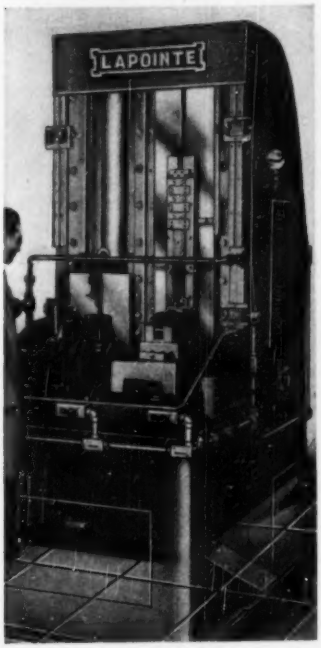


THREAD ROLLER—*Hartford Special Machinery Co., Hartford 5, Conn.* High-production thread roller, for machine-screw sizes from No. 2 to No. 10, will produce from 120 to 150 pieces per min.

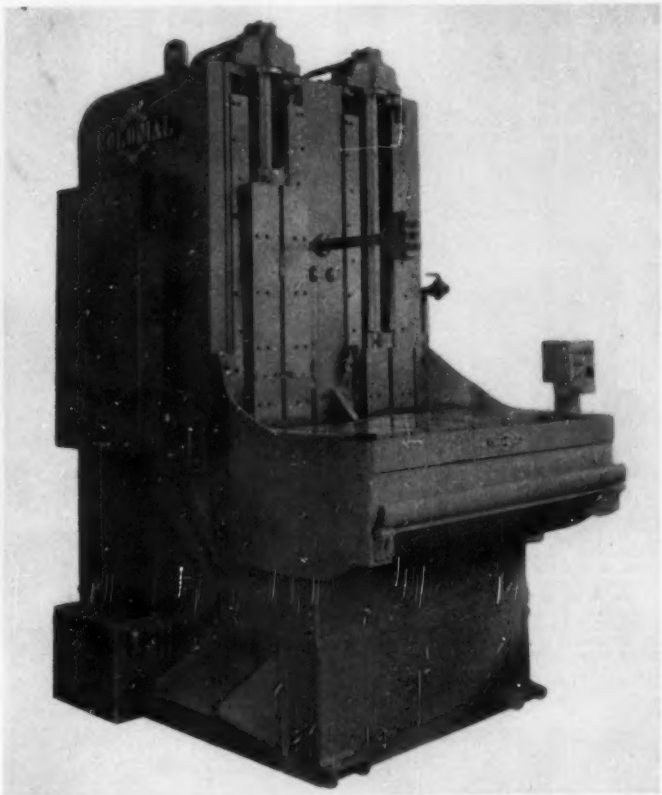


THREAD MILLER — *Wickes Bros., Div. of Wickes Corp., Saginaw, Mich.* Smalley general thread miller employs a multiple-ring tooth cutter for milling straight and tapered, inside and outside, right- and left-hand threads. Tapers up to 4 ipf and a range of 1 to 28 tpi are possible.

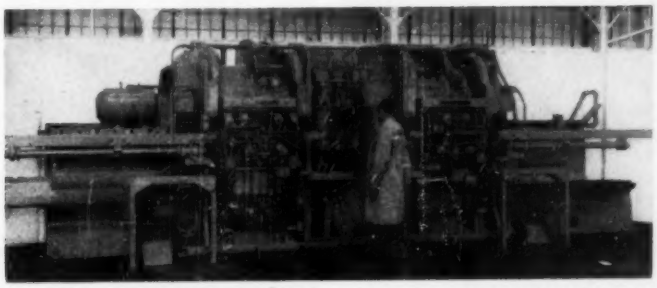
Broaching



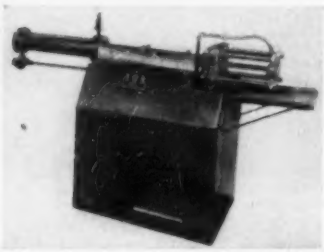
SURFACE BROACH—*Lapointe Machine Tool Co., Hudson, Mass.* Heavy-duty double tip-down fixture and a low-pressure hydraulic system are among the improvements incorporated in this standard double-ram vertical surface-broaching machine.



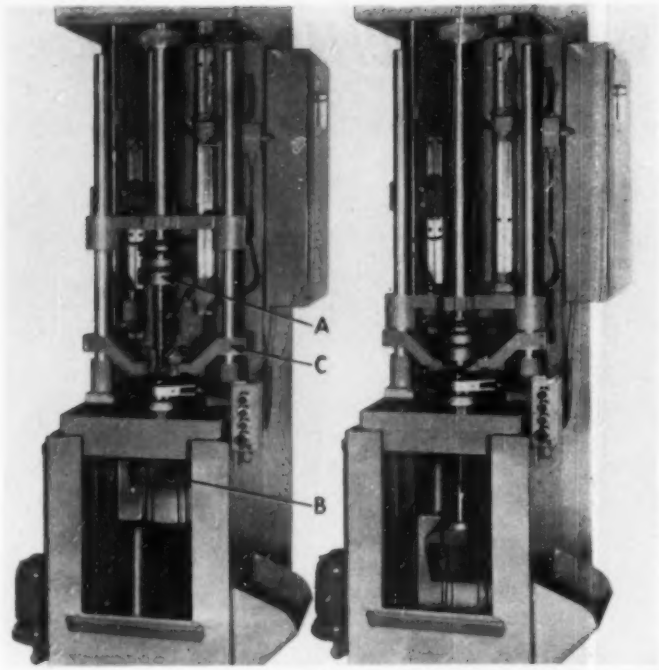
DUAL-RAM BROACH MACHINES—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Line of Dual-Ram broaching machines comprising nine basic sizes for surface broaching, features hydraulic and all-electric control systems, a cycle control system, and a forward and reverse jig cycle to simplify setting up.



MILLING, BROACHING MACHINE—*Cincinnati Milling and Grinding Machines, Inc., Cincinnati, Ohio.* Mill-broach machine combines methods for cylinder blocks and heads. Top side, parting, and manifold surfaces can be roughed out by milling and finished by broaching in one continuous cycle.

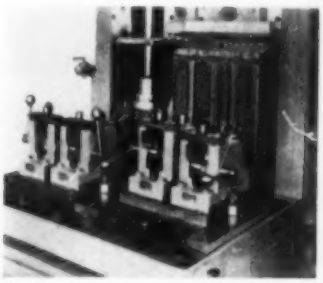


BROACHING ATTACHMENT—*Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 23, Ohio.* Broaching attachment is offered for the Zagar standard 20-in. pull broaching machine for push broaching two holes at one time, maintaining both relationships and hole center spacing. Two broaches are fastened permanently into fixture ram. →

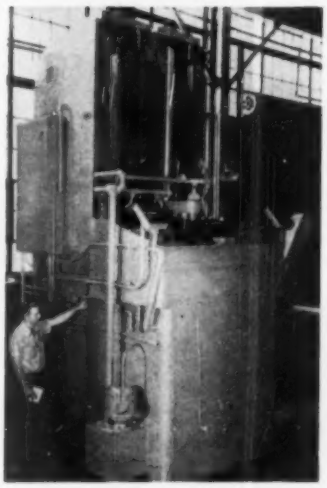


PRESSES—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Automatic broach-handling mechanism, available with Colonial presses (ranging from 4-ton, 24-in. stroke to 10-ton, 36-in. stroke) is said to provide increased output efficiency, reduced accidental damage to equipment, and protection of machine operator's hands when large, heavy broaches are used.

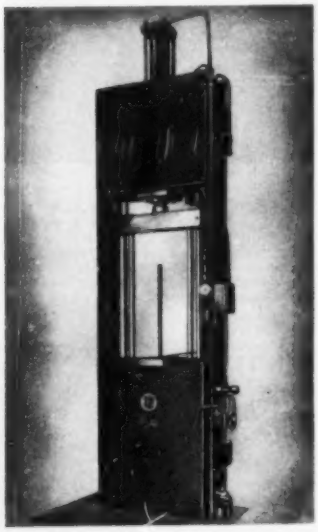
BROACHING MACHINE — *Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* The Colonial "Ram-Press," a universal ram-type hydraulic broaching machine, may be used interchangeably for all conventional broaching operations including surface broaching, internal push broaching, slotting, and press work.



BROACHING MACHINE — *Colonial Broach Co., Detroit, Mich.* A 5-ton, 42-in.-stroke dual-ram surface-broaching machine produces 600 connecting-rod caps of two styles per hr. Four operations are performed each cycle.

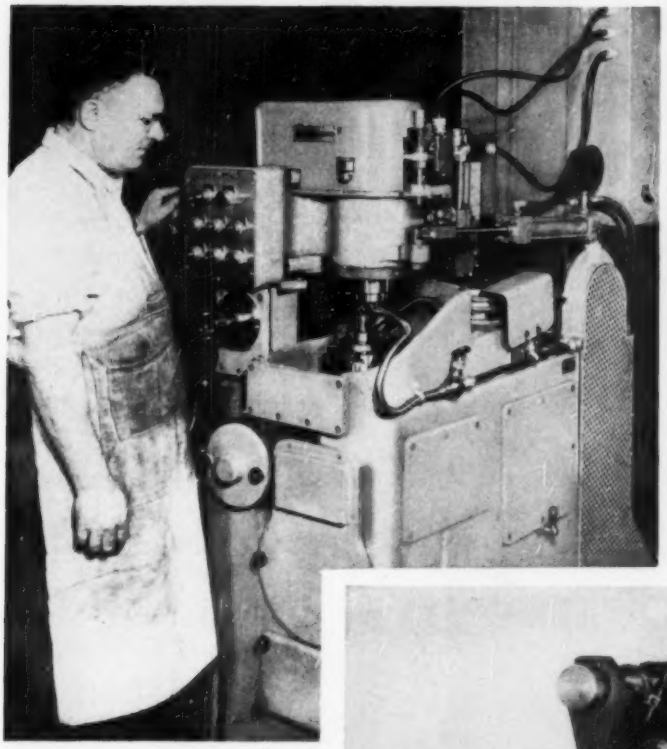


SURFACE BROACHING MACHINE—*American Broach and Machine Co., Ann Arbor, Mich.* Over 15 ft. high, weighing more than 24 tons, this duplex unit broaches large diesel bearing supports.

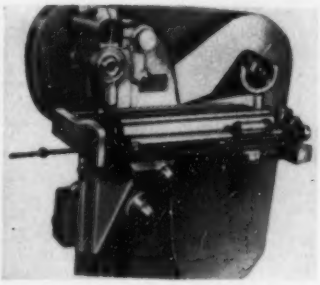


PRESS-BROACH—*K. R. Wilson, 215 Main St., Buffalo 2, N. Y.* Designed for push-pull operations in either vertical or horizontal plane, combination press-broach is available in 25-, 50-, and 60-ton capacities.

Milling

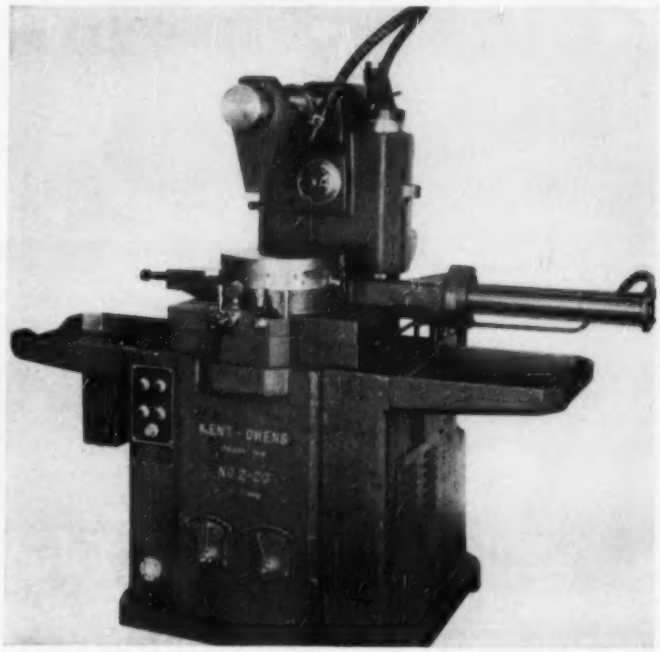


MILLING MACHINE — *Sundstrand Machine Tool Co., Rockford, Ill.* Cam-controlled contour milling machine combines in one unit a vertical-spindle milling head, a cam follower, a cam-carrying table, and a rotary work-table. It is designed for milling irregular contours from master cams.

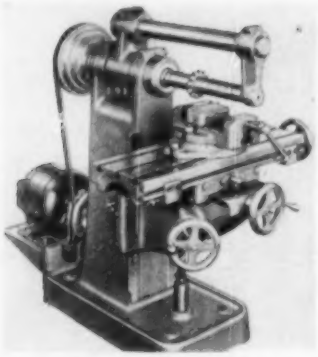


MILLING MACHINE — *The United States Machine Tool Co., Cincinnati 16, Ohio.* The Air-Hydraulic No. 1 feed milling machine is for high-speed semi-automatic production. Table travel speed is adjustable in both directions, and cutting speed is infinitely adjustable.

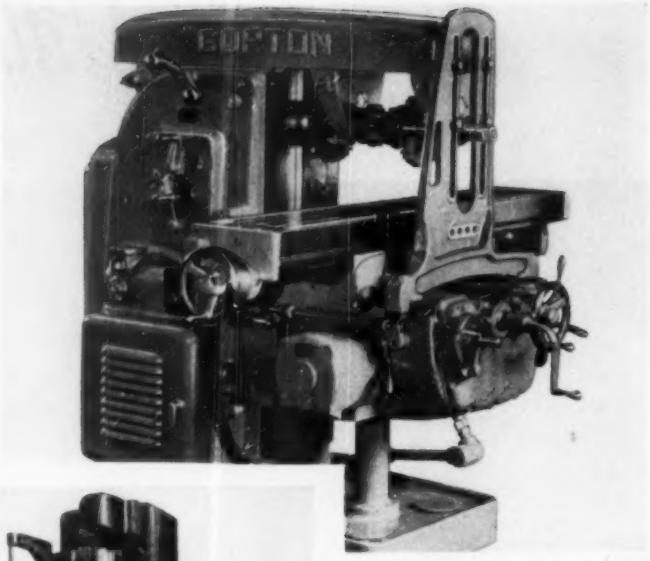
MILLING MACHINE — *Kent-Owens Machine Co., Toledo, Ohio.* Milling machine is equipped with a hydraulically controlled rotary table of 16-in. dia and is driven by a gear and rack mounted at the rear of the fixture. No. 2-20 has twelve spindle speeds ranging from 64 to 860 rpm.



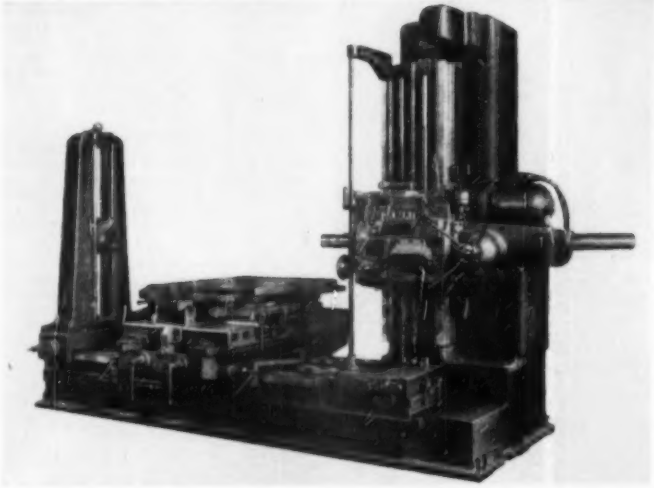
PORTABLE MILLING MACHINE — *Keymil Mfg. Co., Mechanicsburg, R.D. 3, Pa.* The Keymil end mills keyways in shafts from ⅝- to 3½-in. dia. The unit can be driven by motor, drillpress, or by electric or pneumatic drills of moderate speed.



MILLER—*Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles 6, Calif.* A telescopic screw enables the Benchmaster Miller to operate on any bench or stand without drilling the table top for the screw to extend beneath. Traverse feed is 5½ in., and vertical 8½ in.



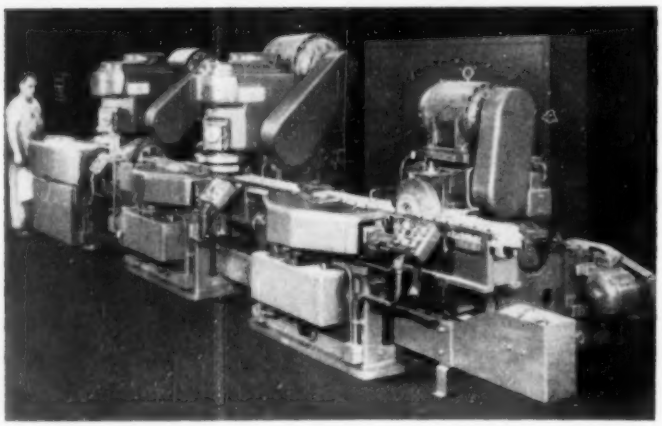
MILLER—*George Gorton Machine Co., Racine, Wis.* No 2 production milling machine has full width knee. The speed-range selector handle and speed-selector crank offer 18 speeds. Working surface is 12x56 in. Range of speed varies from 50 to 2000 rpm.

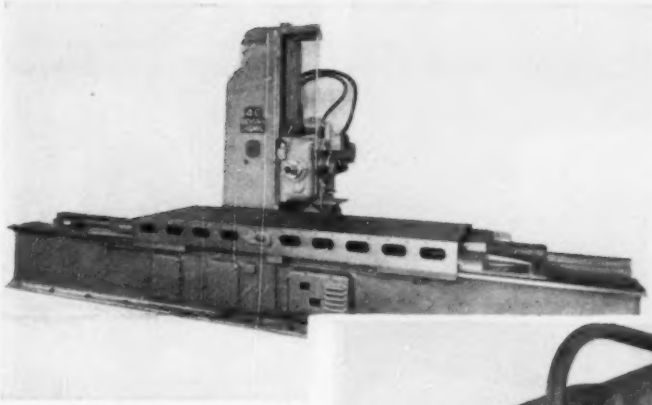


MILLING MACHINE—*The Cincinnati Gilbert Machine Tool Co., Cincinnati 23, Ohio.* Built-in rotary table with a cross feed and power rapid traverse on its saddle is an integral part of this horizontal boring, drilling, and milling machine.

MILLING UNIT—*C. G. Forsman Co., Metal Specialties, 914 Elliott St., S.E., Grand Rapids 7, Mich.* Driven by the lathe head this vertical milling attachment can be adapted to any 9- or 10-in. lathe. Speed of the vertical spindle is double that of the lathe.

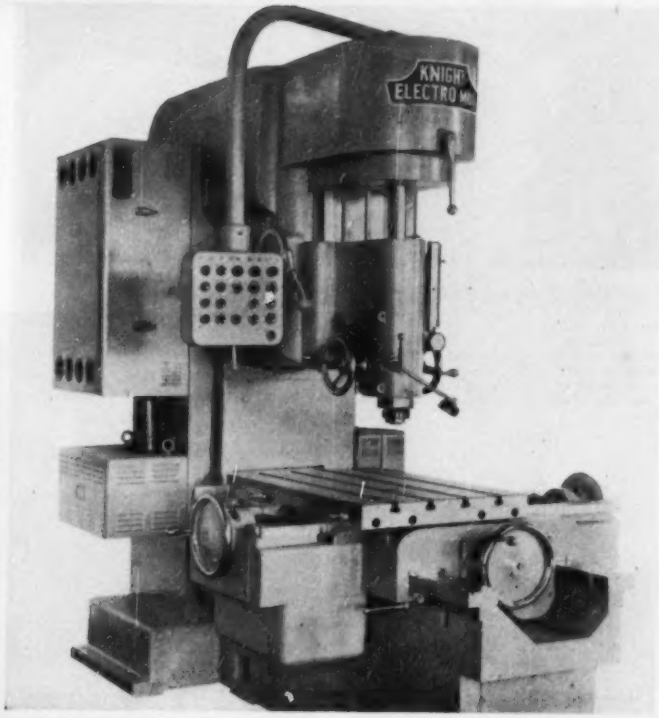
MILLING MACHINE — *Sundstrand Machine Tool Co., Rockford, Ill.* Automatic transfer Rigidmil mills the top, bottom, and both sides of cylinder heads. The machine consists of three milling stations, one turn-over station, an idler station, and loading and unloading stations. ↓



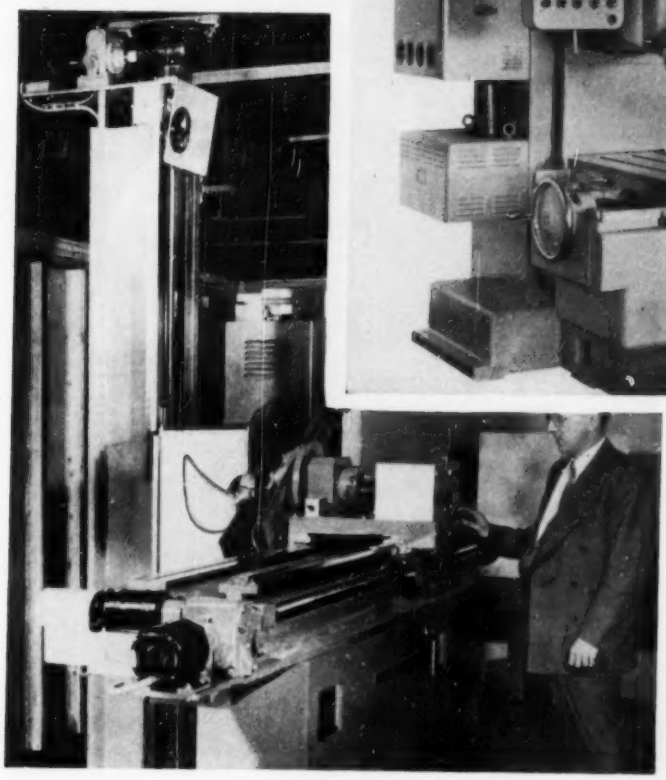


JIGMIL — *DeVlieg Machine Co., 450 Fair Ave., Ferndale, Detroit 20, Mich.* Designed for large-area flat work with short holes, the Model 4-C Jigmil is available with 96- or 120-in. horizontal travel. Vertical spindle travel is from 3 to 53 in. above the top of the table.

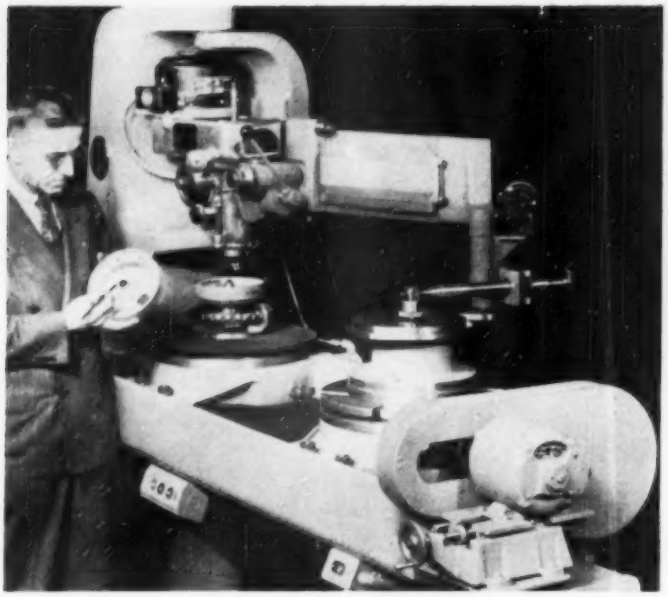
INDEXING HEAD—*Chicago Tool and Engineering Co., 8383 So. Chicago Ave., Chicago 17, Ill.* Equipped with indexing dial graduated in 15-min intervals, the Palmgren No. 86 rotary-indexing milling table has an 8-in.-dia table with two $\frac{5}{8}$ x $1\frac{1}{8}$-in. T-slots.



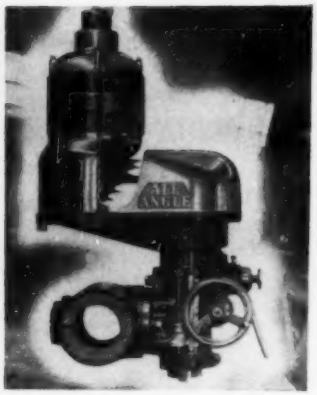
MILLER — *W. B. Knight Machinery Co., 3920 West Pine Blvd., St. Louis 8, Mo.* The Electromill heavy-duty vertical milling, drilling, and boring machine may be equipped with variable-speed motors for wide versatility, or with constant-speed motors for specialized production work.



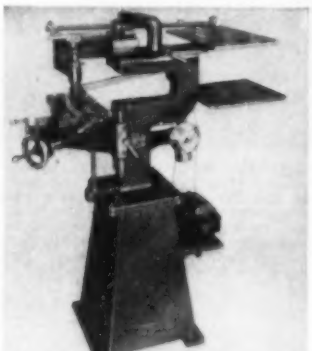
CONTOUR-FOLLOWING MACHINE —*General Electric Co., Schenectady, N. Y.* Electronic contour-following machine can follow the lines of a drawing with an electric eye and guide a machine tool to cut out metal parts according to the drawing. Equipment is capable of following a line in the form of a closed loop with a diameter as small as 0.06 in.



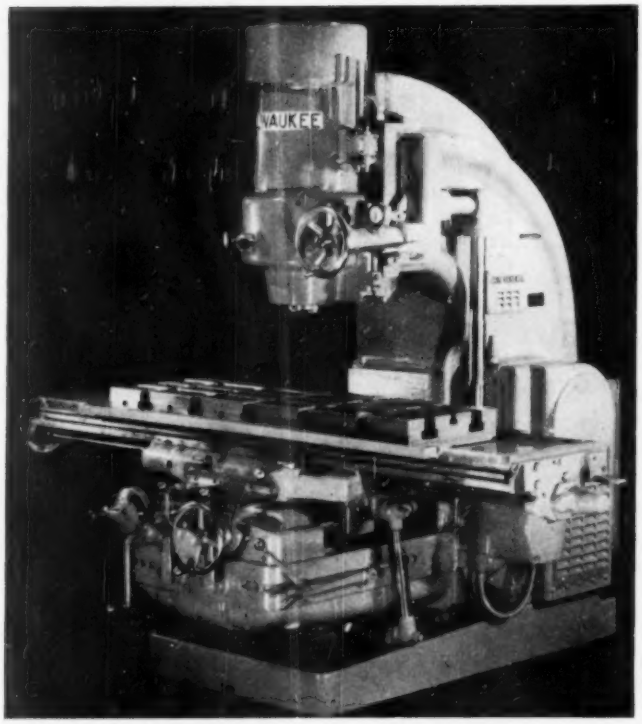
CONTOUR MILL—*The George Gorton Machine Co., Racine, Wis.* This contour mill, No. CM-12, with rotary master, variable ratios, and automatic cycling, profiles or grooves either the inside or outside periphery as well as top of cams or cam-like shapes to extra close tolerances with high surface finishes.



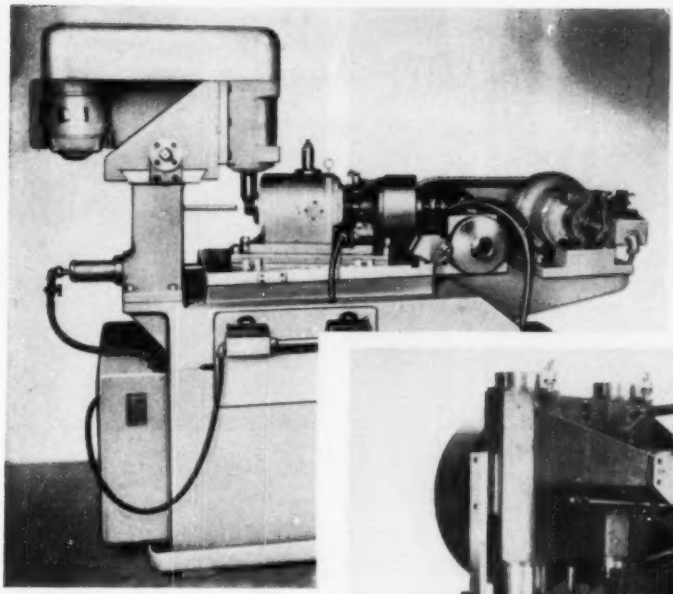
MILLING ATTACHMENT—*Fray Machine Tool Co., Glendale, Calif.* Type 4 milling attachment is precision built for intricate jobs and has a 1½-hp motor for precision high-speed carbide cutting and all-angle flexibility, permitting work at different angles without changing setup.



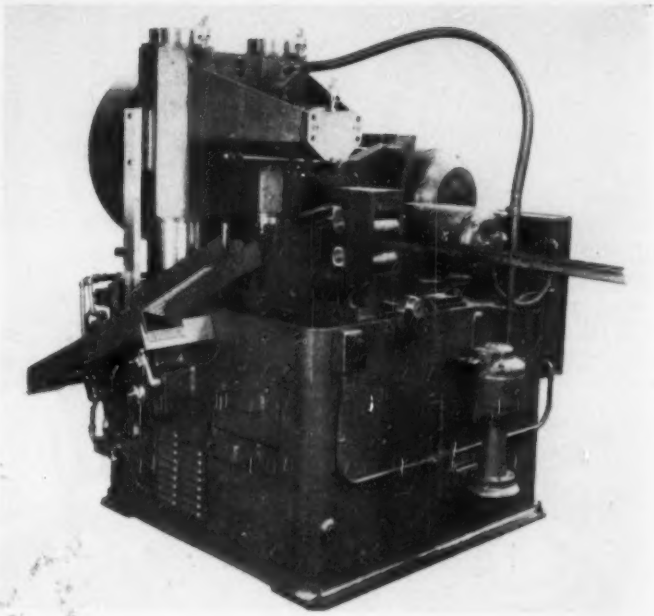
PANTOGRAPH ENGRAVER—*H. P. Preis Engraving Machine Co., 651 State Highway 29, Hillside 5, N. J.* The open trough on the Panto-Engraver permits engraving and profiling in steel dies and molds to center of a 30-in.-dia dial or 30-in. panel. Pantograph ratios from 1 to 1 to full size to infinity are available.



CHUCKING TABLE—*Kearney & Trecker Corp., Milwaukee, Wis.* By means of a built-in chucking table, knee-type milling machines handle irregularly shaped workpieces, without resorting to costly special tools and fixtures, and utilize simplified vise jaws and standard setup accessories.

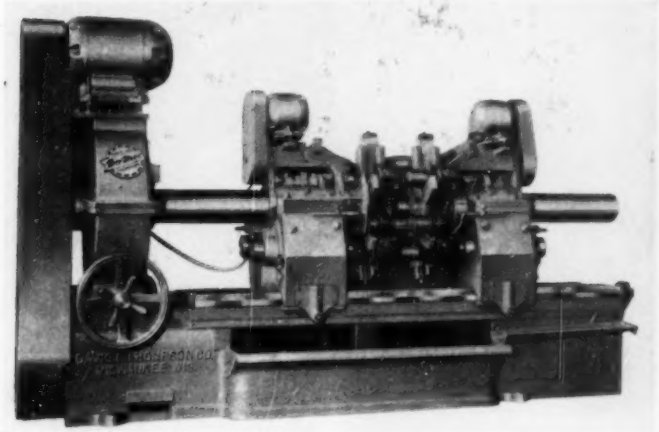


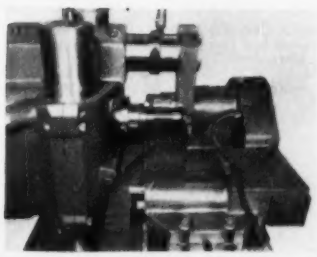
MILLING MACHINE — *The Whiton Machine Co., New London, Conn.* Special-purpose high-production milling machine, for cutting bevel and spur gears and pinions, can perform many milling operations, including any work requiring one or more slots milled on the face or outside diameter; work requiring hex, square, or more sides to be milled, can be handled. The high-production milling machine takes work up to a capacity of 8 in. in diameter. Speed, using high-speed cutters, is 125 sfpm.



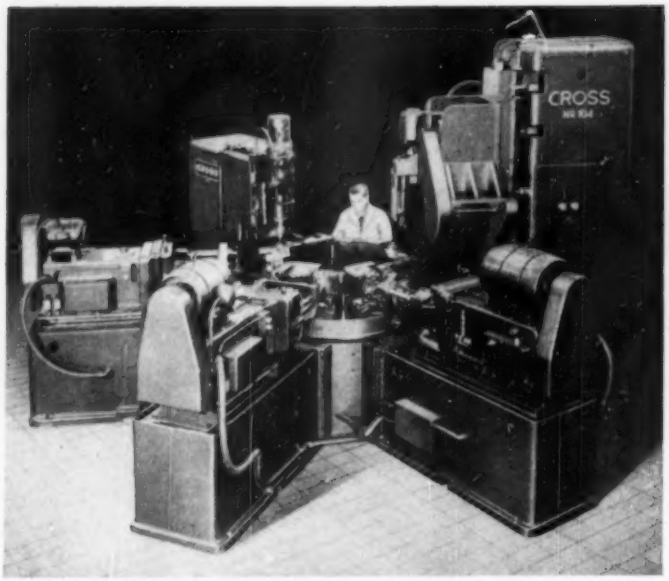
MILLING MACHINE — *Kent-Owens Machine Co., Toledo, Ohio.* Automatic bar-feed machine is for cutting-off or multi-milling operations. Bar is placed in fixture and operation is continuous until bar is used up.

MILLING MACHINE — *Davis and Thompson Co., 6411 W. Burnham St., Milwaukee 14, Wis.* Type MAC milling and centering machine permits finish milling and centering of work simultaneously on both ends.

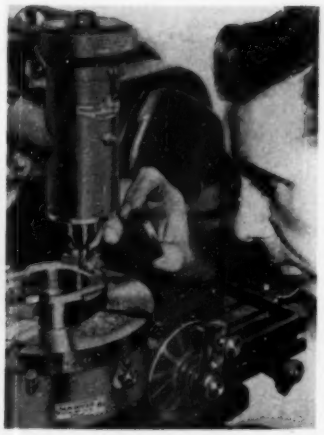




MILLING MACHINE — *Kent-Owens Machine Co., Toledo, Ohio.* The 2-20 milling machine has an automatic index fixture and all necessary tooling for milling irregularly spaced vent slots in piston rings. The machine has a 42x12-in. table with 20-in. table travel.

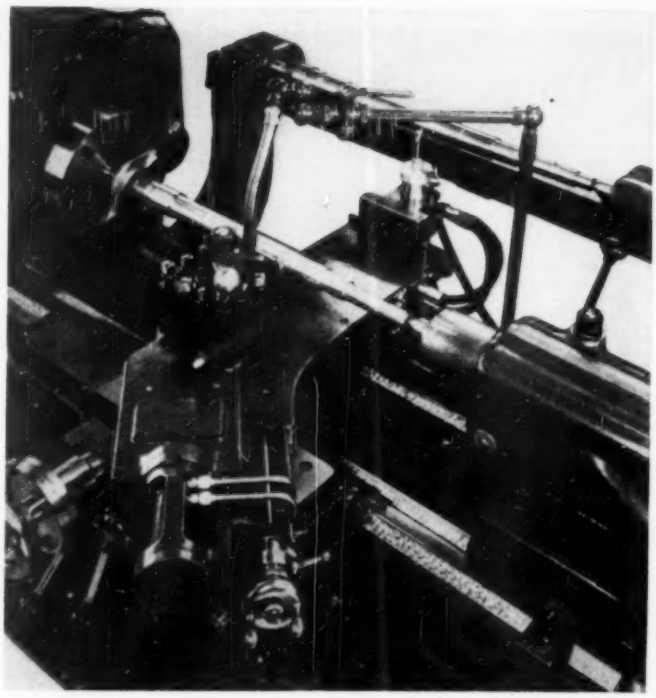


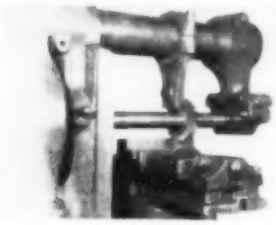
MILLER—*Cross Co., Detroit, Mich.* Double-loading increases output of cross-miller. Water-pump bodies are milled, drilled, bored, reamed, and tapped at the rate of 90 pieces per hr. with one unskilled operator.



MILLING MACHINES ATTACHMENTS — *Marvin Machine Products, Inc., 414 Ford Bldg., Detroit 26, Mich.* Line of attachments giving greater versatility to bench milling machines includes the Marvin vertical-mill and slotting attachment, and a low-cost rotary table.

MILLING TABLE—*Leo G. Brown Engineering Co., 1531 S. Sunol Drive, Los Angeles 23, Calif.* A ball-tilting milling table is made from fine-grade Meehanite semi-steel normalized castings. The T-slot is $\frac{1}{8}$x$\frac{7}{8}$ in. and the table has a $\frac{1}{2}$-in. bolt.





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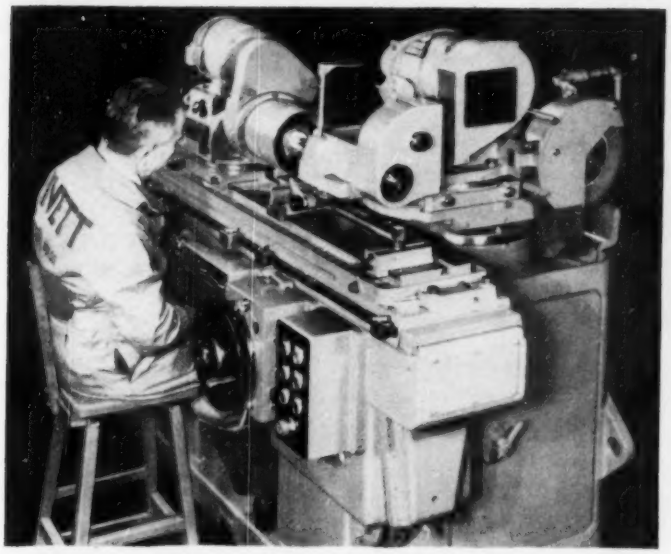
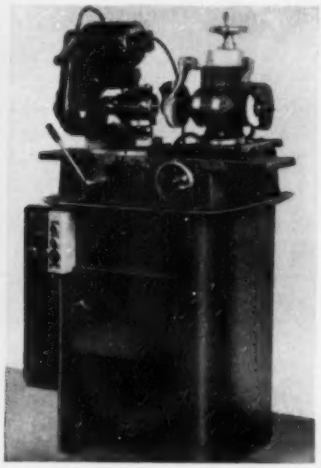
ARBOR SUPPORT—*The Federal Machine Tool Co., Emmett St., Bristol, Conn.* This arbor support can be attached close to the cutter without interfering with the operator and is adjustable for use on any diameter arbor.

AUTOMATIC FOLLOWER — *Turchan Follower Machine Co., Detroit 4, Mich.* Milling machines can be converted into die-duplicating units by controlling either the movement of head or knee with the Turchan automatic follower.

Grinding, Honing, Lapping



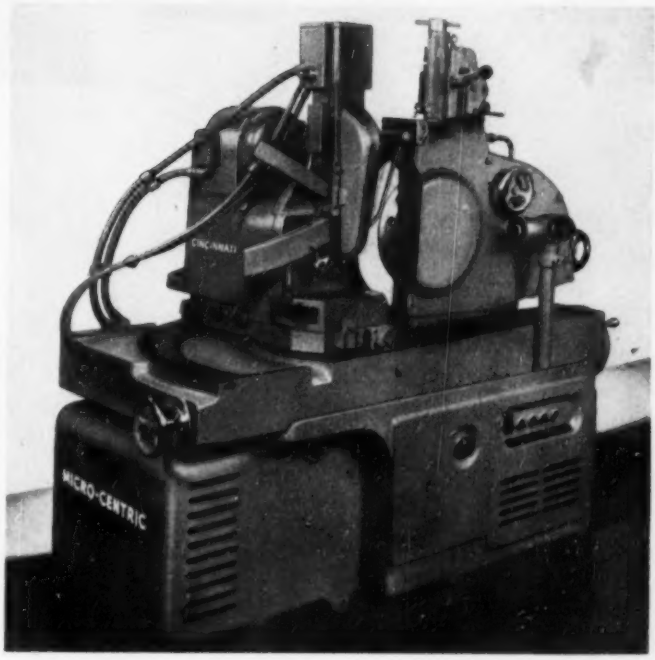


TOOL GRINDER—*D-S Grinder Div., Royal Oak Tool & Machine Co., 621 E. 4th St., Royal Oak, Mich.* A GE Thymotrol drive on the D-S radial relief tool grinder gives stepless speed control through 18 to 150 rpm at the turn of a dial.

GRINDER—*Rivett Lathe & Grinder, Inc., Brighton 35 (Boston), Mass.* The 1020 universal hydraulic grinder can be adapted for internal, external, and face grinding. Workhead spindle is infinitely variable from 100 to 600 rpm.

GRINDERS — *Mattison Machine Works, Blackhawk Park Ave., Rockford, Ill.* Mattison Machine Works has purchased a line of production grinding machinery, formerly made by Hanchett Mfg. Co. of Big Rapids, Mich.

KNIFE GRINDER—*Samuel C. Rogers & Co., Buffalo 11, N. Y.* NT hydraulic knife grinder provides variable table speeds from 10 to 70 fpm. A high work speed giving a rough finish can be reduced automatically without stopping the machine, to give a high finish.



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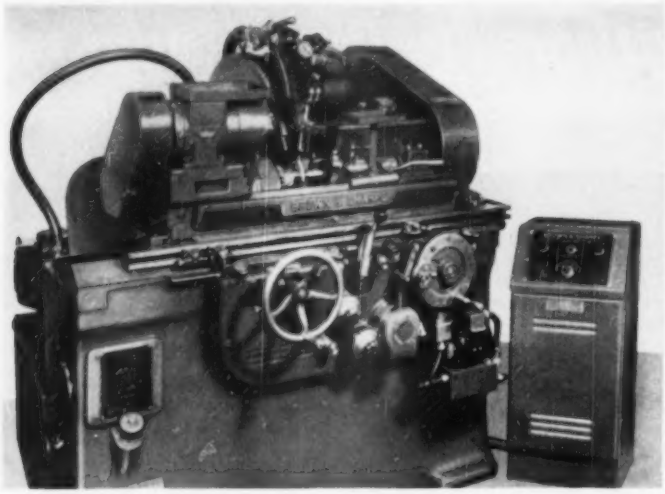
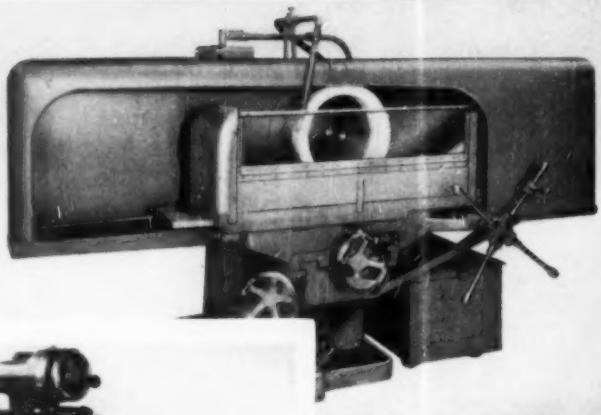
GRINDER—*Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.* Filmatic No. 1 and 2 Micro-Centric grinding machines are primarily for the manufacture of bearing races and other short parts ground to superprecise tolerances of roundness and squareness with one side. Employing a principle of work support and rotation, the machine will, without centers or a chuck, hold roundness under 0.000025 in.



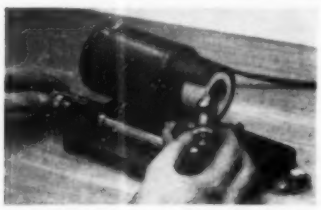
CYLINDRICAL GRINDER—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Two automatic-cycle arrangements on cylindrical grinding machines reduce idle-time and require less operator attention. Simplification of setup and operation permits the grinding of even small lots with greater accuracy at less cost.

SURFACE GRINDER—*Covel Mfg. Co., Benton Harbor, Mich.* A hydraulic unit with 8x24-in. capacity, the No. 35 grinder is designed to provide a larger capacity Covel grinder at a moderate price. It has spindle speeds of 1750, 2200, and 2600 rpm.



GRINDER—*Landis Tool Co., Waynesboro, Pa.* The Landis Tool tap-point relief grinder will accommodate taps from No. 2 to 1-in. dia. It is reported to have ground four-flute ½-in. taps with 0.010-in. relief at the rate of 300 per hr. ↓

GRINDER—*Abrasive Machine Tool Co., East Providence 14, R. I.* The 15-hp 900-rpm motorized spindle on this face grinder eliminates all pulleys and belts. A 13- x 36-in. work surface and 24-in. table travel facilitates wide range in face-grinding applications.

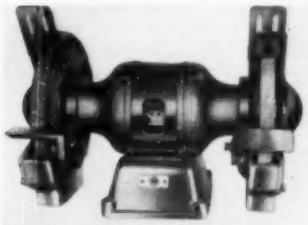


GRINDER — *Green Instruments Co., 385 Putnam Ave., Cambridge, Mass.* Equipped with an ac-dc preload ball-bearing motor delivering 1/10 hp, this grinder is for sharpening small engraving cutters. Hand-operated infeed is graduated in 0.001.

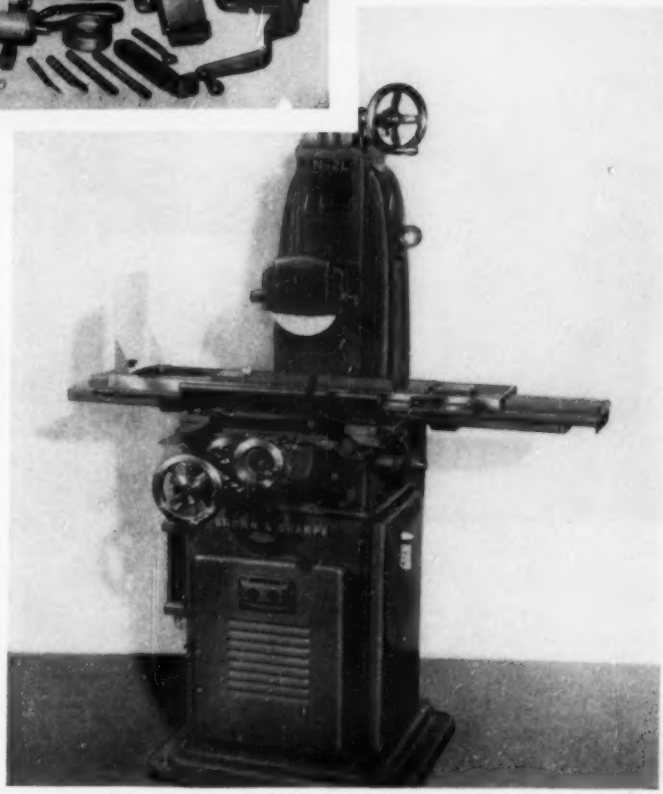
CARBIDE-TOOL GRINDER—*Hammond Machinery Builders, Inc., Kalamazoo, Mich.* The model WD-10 carbide-tool grinder can be used either wet or dry. It is supplied with a coolant system for wet operation and a baffle plate and exhaust system for dry operation.

GRINDING MACHINES—*Brown and Sharpe Manufacturing Co., Providence, R. I.* No. 2L and 2LB surface grinding machines have automatic lubrication for all moving parts and surfaces. No. 2L has automatic feeds and the No. 2LB, hand feeds. Vertical adjustment of the wheel-spindle slide is 10 in.

CUTTER, TOOL GRINDER—*Gallmeyer & Livingston Co., Grand Rapids 2, Mich.* The No. 10 universal cutter and tool grinder is a medium-capacity machine, moderately priced. The head can be swiveled through 180° and locked at desired setting.

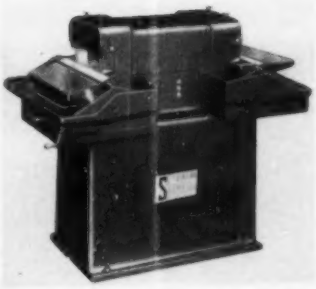


GRINDER—*Baldor Electric Co., 4351-67 Duncan Ave., St. Louis 10, Mo.* Featuring large clearance between wheels and motor frame, the Baldor 10-in. grinder is available in single-phase, ¾-hp or three-phase, 1-hp models.

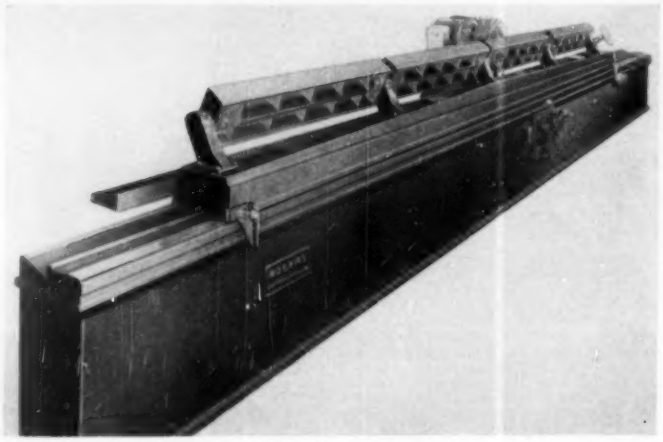


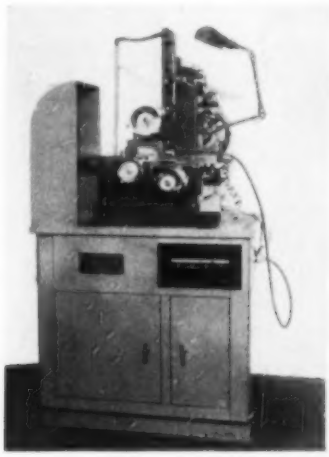
FLEXIBLE-BELT GRINDER—*Hammond Machinery Builders, Dept. GP-50, Kalamazoo, Mich.* Model V-2WP Wet-N-Dri flexible-belt grinder, especially suited for the wet deburring and finishing of plastics, can be used for grinding, polishing, shaping, chamfering, squaring, and other operations on ceramics, wood, rubber, glass, bone, ferrous, and non-ferrous metals. →

GRINDER—*Landis Tool Co., Waynesboro, Pa.* General-purpose cylindrical grinding machine is for small-lot manufacturing purposes in shops, toolrooms, and for training purposes. Machine will swing 12-in dia work, and is equipped with a 12-in-dia grinding wheel, powered by a 1-hp spindle.



TOOL GRINDERS—*Standard Electrical Tool Co., 248 W. 6th St., Cincinnati 4, Ohio.* Two carbide-tool grinders, for wet or dry grinding, feature vibration-free construction and are V-belt motor driven. They are available in 1 and 3 hp.



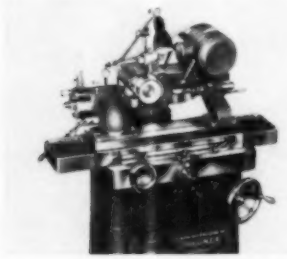


SURFACE GRINDER—*Jakobsen Tool Co., 223 Glenwood Ave., Bloomfield, N. J.* Diameters from 1/16 to 5 in. or more can be handled by sensitive surface grinder, designed for toolmakers and small-parts grinding. Variable wheel speeds give maximum flexibility.

TOOL GRINDER—*The Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* Type 10TD twin-wheel wet or dry tool grinder is for carbide, stellite, and high-speed steel tools. Graduated independent-tilting tables tilt 15° above and 30° below the horizontal.

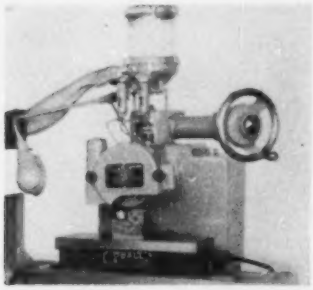
GRINDER—*The Standard Electrical Tool Co., 2480 W. 6th St., Cincinnati 4, Ohio.* Type BDG multi-speed grinder has three spindle speeds and maintains 6500 sfm on vitrified-bond wheels and 9500 sfm on resinoid-bond wheels.

GRINDER—*S. C. Rogers & Co., 191 Dutton Ave., Buffalo 11, N.Y.* A straight knife grinder, Model 2, is for end-to-end precision grinding of any heavy chipper knife, shear blade, paper-cutting knife, or doctor blade up to a 220-in. length.

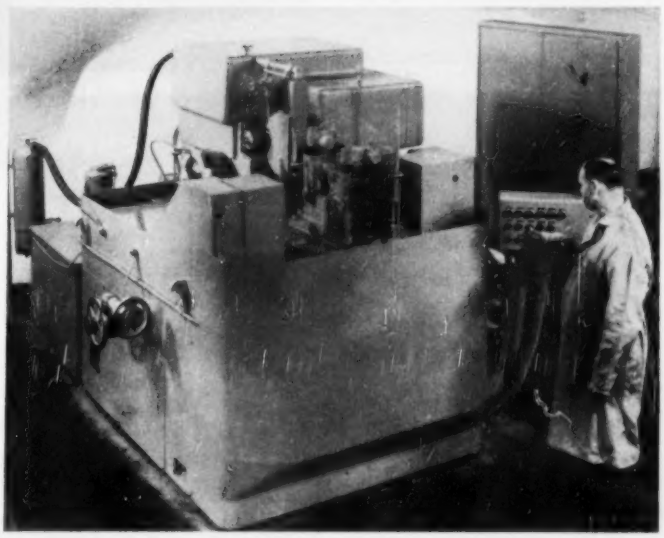


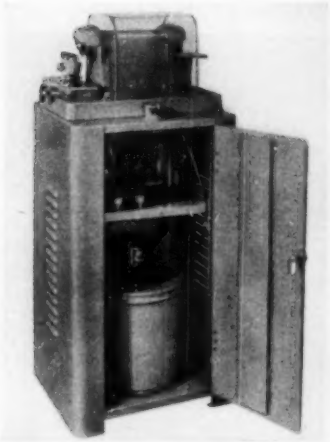
GRINDER—*Nife Inc., 165 Broadway, New York 6, N. Y.* On the Jungner Type US-21 universal grinding machine, work is ground against the cutting edge. This counter-grinding principle is said to avoid 1) drawing the temper, 2) wire edge, and 3) nicks on the cutting edge.

GRINDER TABLE—*Brown & Sharpe Mfg. Co., Providence, R. I.* The Electralign, for electronic alignment of grind-machine swivel table, ignores the condition of the table pivot, table wear which may occur with time, the weight of the workpiece, and the location of the headstock and footstock on the table. True swivel movements are indicated without relation to these variables.

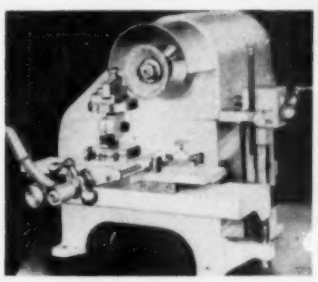


GRINDER — *The DoAll Co., Des Plaines, Ill.* On DoAll precision surface grinder, coolant is injected into the pores of the grinding wheel, and leaves the wheel in the form of a mist at the point of work. This system is said to assure complete control of heat generated.



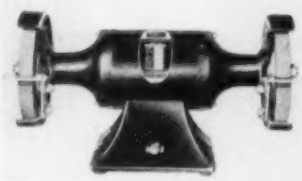


TOOL GRINDER—*United States Diamond Wheel Co., 701 Illinois Ave., Aurora, Ill.* Carbide grinder features small-diameter wheels and accommodates tools having up to 1-in. shanks. It is equipped for wet grinding and runs smoothly at 9000 rpm.



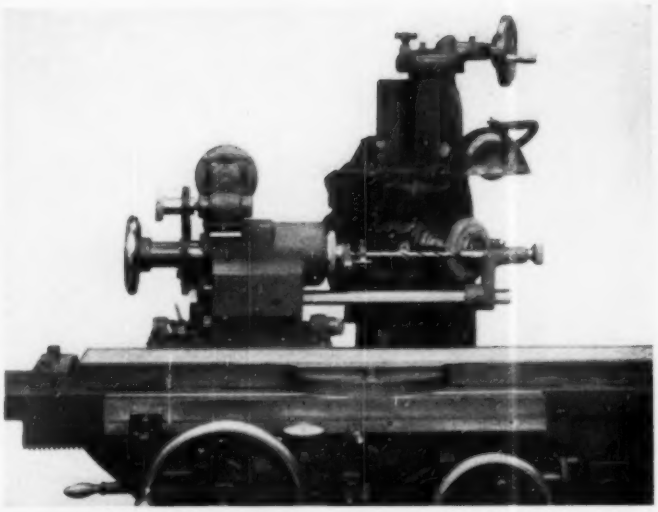
TOOL GRINDER — *Gopher Machine and Engineering Co., 5353 University Ave., S. E., Minneapolis 1¼, Minn.* Equipped with a precision-built spindle the Gopher tool grinder grinds all automatic screw-machine and turret-lathe tools including chasers, circular form tools, dovetail tools, block tools, and toolbits.

GRINDER—*Thompson Grinder Co., Springfield, Ohio.* Concave or convex forms of irregular contour are ground on the edges of flat pieces by the Truformatic single-pass machine.



GRINDER — *Electro Machines, Inc., Cedarburg, Wis.* This low-priced grinder provides ample working area in front of the motor frame and in the space between the frame and inside of the grinding wheels.

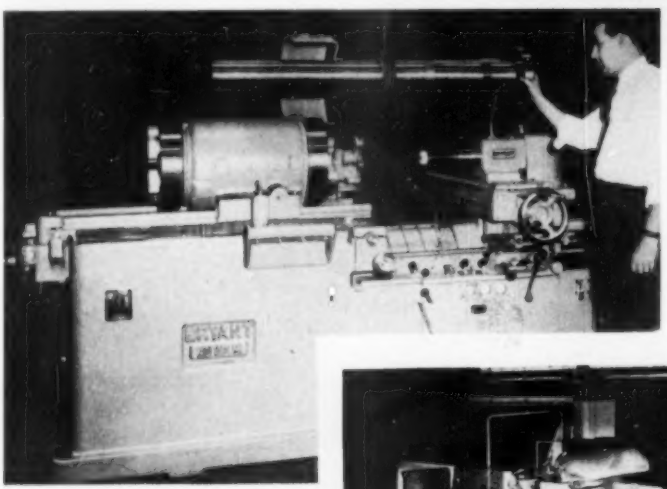
GRINDING FIXTURE—*Madison Mfg. Co., Muskegon, Mich.* Cutter grinding fixture has been used to grind cutting edges, steps, flutes, and chip relief on Madison roughing and reaming cutters, milling cutters, chamfering tools, and turning tools.



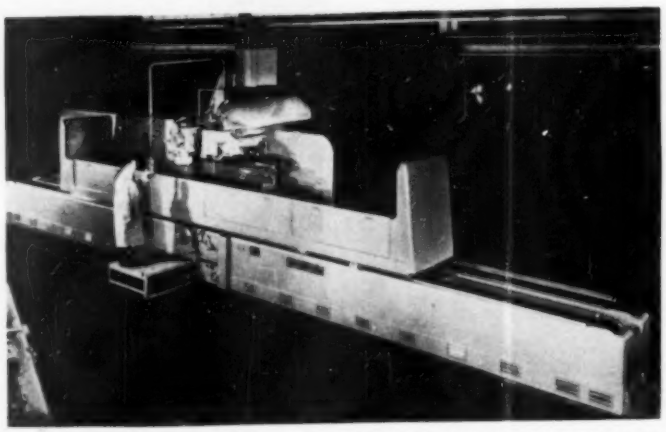
GRINDING FIXTURE — *Glenbard Tool Manufacturers, Inc., 216 N. Clinton St., Chicago, Ill.* The Spi-Rad is capable of "on center" spiral and radial relieving. It can be fitted to any universal tool grinding machine.

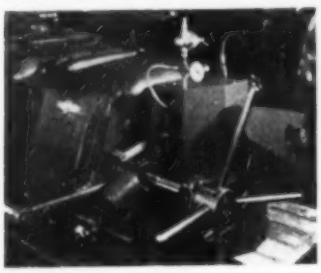
AIR BACKSTAND—*Hammond Machinery Builders, Inc., Kalamazoo 54F, Mich.* Model 3-A air backstand is designed for heavy production grinding or polishing with abrasive belts. An air-actuated cylinder automatically maintains correct belt tension.

BUFFER-GRINDER—*Baldor Electric Co., 4551 Duncan Ave., St. Louis 10, Mo.* The No. 60 series buffer-grinder is powered with ¼-hp 3400-rpm capacitor-start capacitor-run motor.



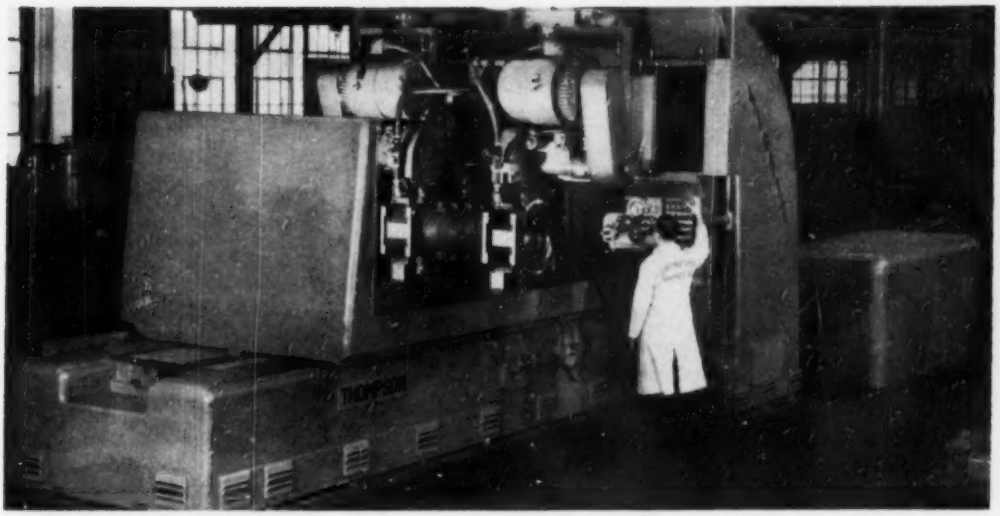
INTERNAL-GRINDER WORKHEAD—*Bryant Chucking Grinder Co., Springfield, Vt.* A double-chuck workhead added to the No. 112-M internal grinder permits precision grinding of large parts. The workhead can be moved longitudinally to position the work for grinding.



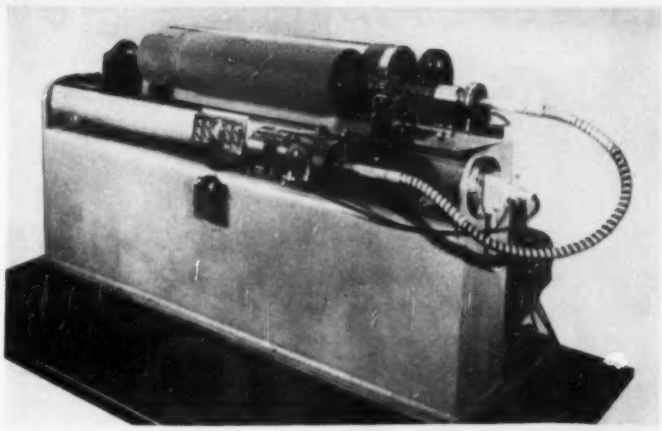


GRINDER ATTACHMENT—*The Bennett Equipment Co., 4725 Ellery, Detroit 7, Mich.* Auto-feed attachment permits the No. 2 Cincinnati centerless grinder to be operated either automatically or manually with a changeover time of ← less than 2 min.

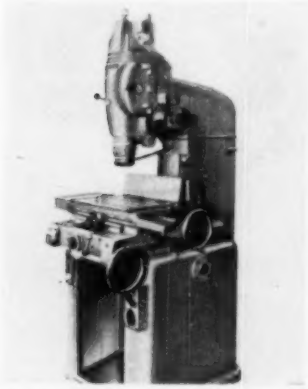
SURFACE GRINDERS—*Thompson Grinder Co., Springfield, Ohio.* The Thompson heavy-duty Type CX, 30x48x 196-in. hydraulic way grinder has a 46-ft. bed length and was manufactured for a lathe manufacturer to grind the ways of its larger machines.



SURFACE GRINDER — *Thompson Grinder Co., Springfield, Ohio.* Double-column Hydrail surface grinders mount either one or two wheelheads and are for production and maintenance jobs on large work in the railroad, automotive, aircraft, and other industries. Wheelheads are powered with 30- to 50-hp motors. Hydraulic table travel is infinitely variable from 10 to 100 fpm.

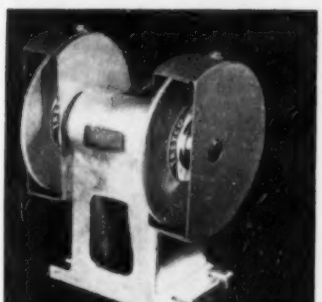


ROLL GRINDER—*Ryman Engineering Co., Ellwood City, Pa.* Integral roll grinder, based on a new grinding principle, has two applications. The "in machine" can handle large calendar rolls, used in the manufacture of plastic sheeting, without removal from the machine. The "out machine" operates where rolls are taken out of the machines and brought to the grinder. Abrasive belts are the cutting medium.

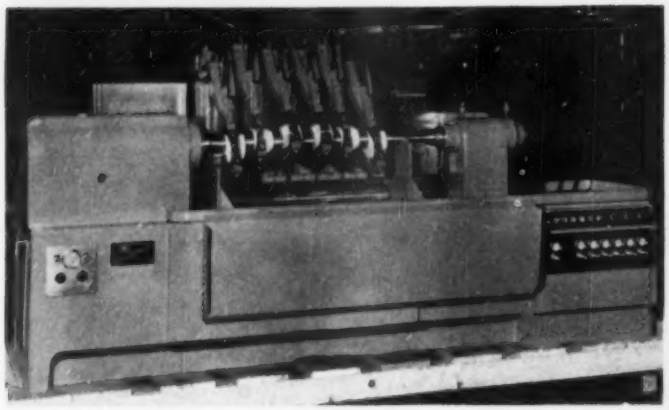


JIG GRINDER—*Hauser Machine Tool Corp., Manhasset, N.Y.* With 16-in. longitudinal travel and 10-in. traverse travel, the Hauser Model 3S has a grinding-diameter capacity of 5 in. Spindle speeds up to 75,000 rpm are obtained.

CONTOUR MACHINE — *Thompson Grinder Co., Springfield, Ohio.* Grinding time on 8-in. circular wood saws is said to be cut from 10 to 2½ minutes on the Thompson Truforming contour grinder.



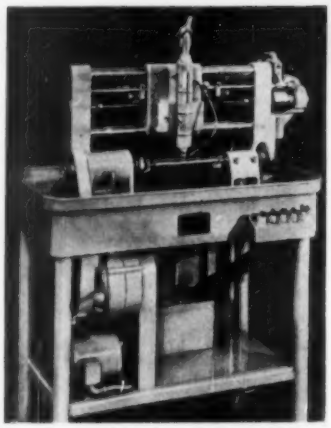
GRINDING STAND — *Treyco Products, Buffalo 17, N. Y.* With center line of the shaft only 1 in. back of the front of the base, allowing free movement of the sharpening fixture, the Model 300 grinder stand is said to provide 25% greater life of the grinding wheel.



CRANKSHAFT SUPERFINISHER—*The Gisholt Machine Co., 1245 E. Washington Ave., Madison, Wis.* Longitudinally adjustable arms of the Model 71 Superfinisher permit the machine to handle a variety of sizes of crankshafts up to 60-in. length.

SHARPENING FIXTURE — *Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Ejector-tool-insert grinding fixture is for sharpening and grinding any insert with either flat or dished chip breaker.

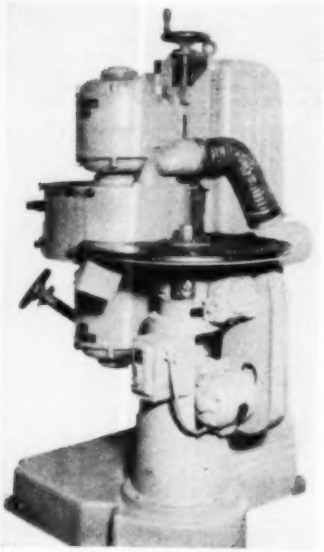
HOLE GRINDER — *Onsrud Machine Works, Inc., 3921 Palmer St., Chicago 47, Ill.* The Onsrud D1-S precision hole grinder is a high-speed air-turbine motor, mounted on a Chandler boring and facing head. It can be mounted on jig borers, vertical and horizontal milling machines, boring mills, lathes, surface grinders, internal grinders, and drillpresses.



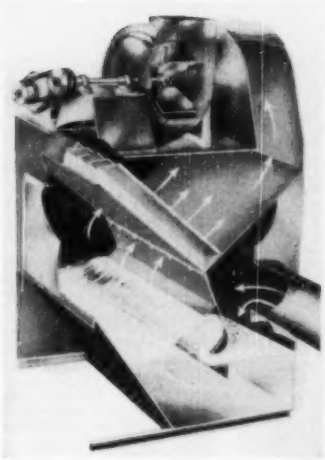
SUPERFINISHING MACHINE — *Gisholt Machine Co., Madison 10, Wis.* A general-purpose machine designed to handle medium to small cylindrical parts, Model 50 has a capacity of 12 in. between centers, 8½-in. swing, 3-in. maximum working diameter.

GRINDER—*Nu-Matic Grinders, Inc., 10304 W. McNichols Road, Detroit 21, Mich.* Embodying a pneumatic rubber drum inflated at low pressures, the Nu-Matic grinder is a low-cost power-wheel unit for grinding, sanding, or polishing curved, irregular, and contour surfaces.

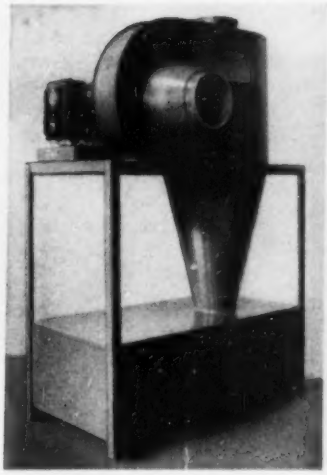
GRINDER-MILLER — *Precise Products Co., 1828-30 Clark St., Racine, Wis.* With a speed of 45,000 rpm and over 1/5-hp, the Precise Super 40 grinder-miller can be used with or without the Coolflex extension or in machine setups. It operates mounted wheels to 1¼ in. in dia, unmounted wheels, cutoff wheels, and metal saws with special arbors.



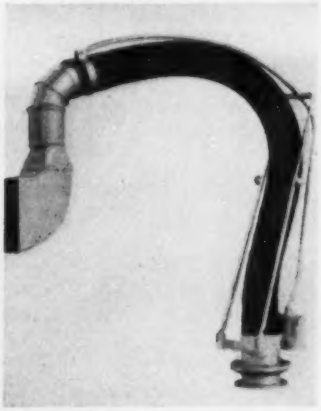
VERTICAL GRINDER — *Charles H. Besly and Co., 118-124 N. Clinton St., Chicago 6, Ill.* A double vertical-spindle grinder for precision grinding of small parts operates wet or dry as fast as the work can be loaded.



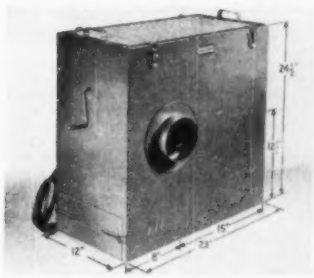
DUST COLLECTOR — *American Air Filter Co., Inc., 215 Central Ave., Louisville, Ky.* For collection and control of dust generated in manufacturing and process operations, the Type N Roto-Clone is a hydrostatic precipitator that cleans the air.



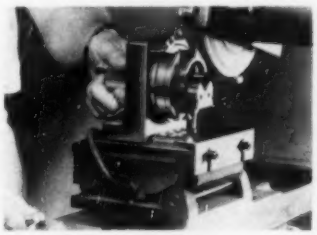
DUST COLLECTOR—*Aget-Detroit Co., 306 Main St., Ann Arbor, Mich.* The Model 20N30 Dustkop self-contained portable 2300-cfm dust collector handles dust and dirt, or toxic fumes separately or in combination from various types of cutting, grinding, and other machining operations.



SUCTION TUBE—*Torit Mfg. Co., 303 Walnut St., St. Paul 2, Minn.* Suction-tube assembly is for connecting self-contained dust collectors to wheels on surface grinders, tools, and cutter grinders, and other machines that cannot be properly hooded.

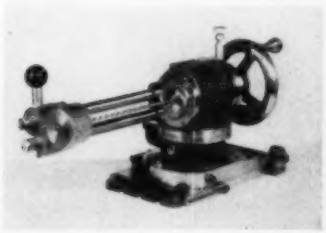


DUST COLLECTOR—*Aget-Detroit Co., Ann Arbor, Mich.* Model 420, called the Dustkop, is for use in polishing, buffing, and grinding operations involving larger wheels and bigger volumes.

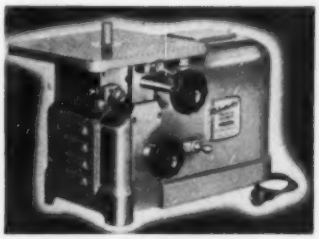


GRINDING FIXTURE—*The Harig Mfg. Co., 319 N. Albany Ave., Chicago 12, Ill.* Perforator grinding fixture can grind all types of regular and irregular contours to within ±0.0002.

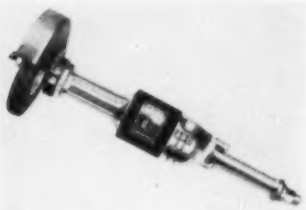
DUST COLLECTOR—*Hammond Machinery Builders, Inc., 1630 Douglas Ave., Kalamazoo 54, Mich.* Semi-portable Duskolectors are offered in three models and can be used with different grinding machines. Installation requires only piping to grinder with flexible metal tubing or metal pipe.



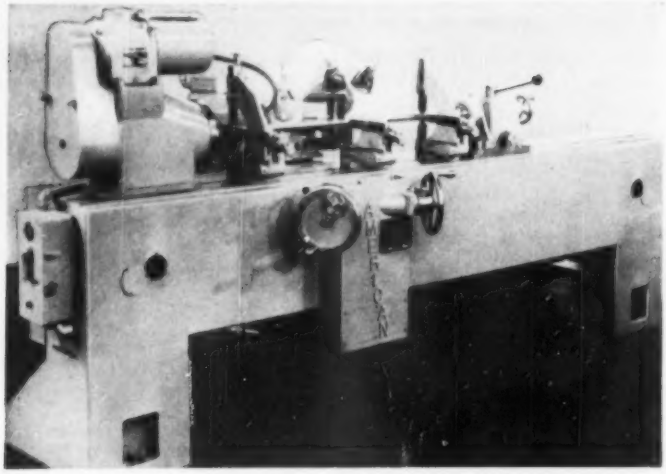
GRINDING FIXTURE — *Royal Oak Tool and Machine Co., 621 E. 4th St., Royal Oak, Mich.* Accessory for the D-S grinding fixture makes possible radial relief grinding of long tools not equipped with centers. Accessory mounts on the bars provided as a standard part of the fixture and holds the tool close to the end for grinding support.



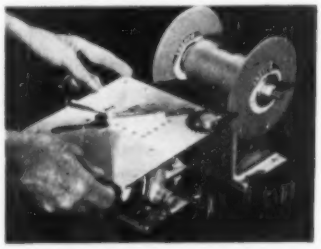
PROFILE GRINDER—*Rice Pump & Machine Co., 1025-B S. 40th St., Milwaukee 4, Wis.* Bench-type profile grinder, for high-speed precision grinding of internal and external contours, curved, odd, and irregular surfaces, is adaptable to the grinding of die clearances, sharpening cutter dies and punches, grinding cams, and finishing hardened-steel parts.



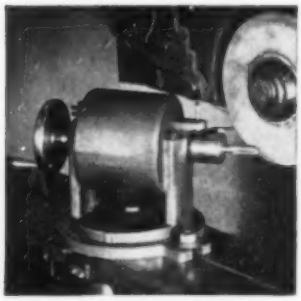
GRINDER — *The Arc Equipment Corp., Bryan, Ohio.* Air-powered portable 8-in. grinder has magnesium castings for lightness and a steel housing for protection. Speed is governor-controlled whether idling or under heavy load.



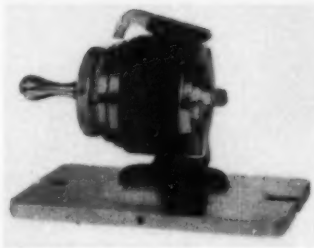
BROACH SHARPENER — *American Broach and Machine Co., Ann Arbor, Mich.* Work is mounted between centers on the stationary bed on Model RBS cylindrical-broach resharpening machines and the grinding-wheel spindle is mounted on a traversing carriage. The machine is for resharpening internal broaches.



SHARPENING FIXTURE — *Treyco Products, Buffalo 17, N. Y.* With an 8-in.-square table top which may be tilted and set up to 80° to either side, Model 135 all-purpose sharpening fixture is for sharpening carbide-tipped tools, cutters, and all types of circular saws from 1½ to 12 in. in diameter.



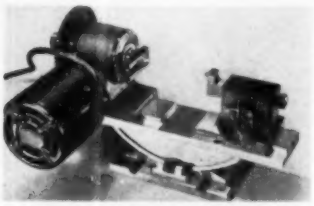
TAP SHARPENER — *Car-Anth Mfg. and Supply Co., St. Louis 9, Mo.* Car-Anth sharpener handles any 2-, 3-, or 4-fluted taps with shank sizes up to ½ in.



GRINDING FIXTURE—*Royal Oak Tool & Machine Co., 621 E. 4th St., Royal Oak, Mich.* Grinding fixture provides for flat or concave grinding of chip breakers on tungsten-carbide insert-type bits.

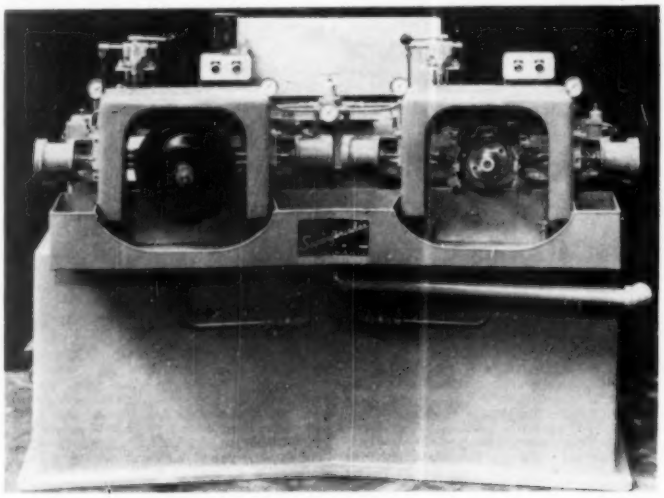
DUST SEPARATOR—*Torit Mfg. Co., St. Paul 2, Minn.* Twin-Cyclone dust separator No. 219 incorporates two cyclone separators. Capacity is about 4½ cu ft.

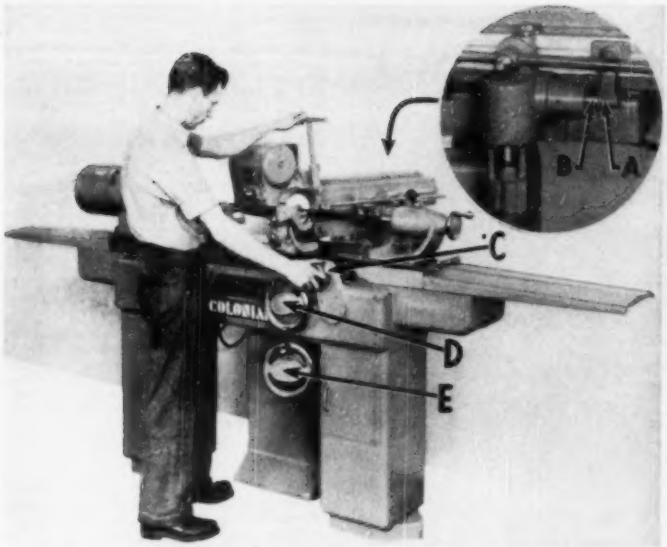
BALL HONING TOOLS—*C. Allen Fulmer Co., Cincinnati, Ohio.* Alexander Ball line of British-built honing tools permits use of honing as a production stock-removing process in small-size shops.



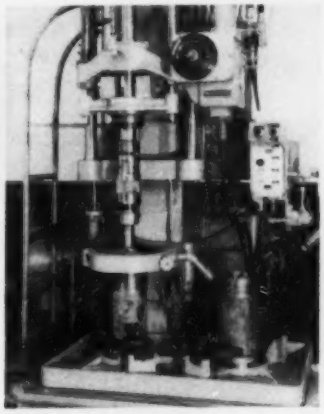
GRINDING CENTERS—*Moore Special Tool Co., Bridgeport, Conn.* Flat, curved, or circular work; straight, tapered, and contour outlines, all within 0.0005 in., can be set up for grinding on Moore motorized centers, which provide for indexing in the same setting.

SUPERFINISHER—*Gisholt Machine Co., Madison, Wis.* Automotive brake drums come to the Gisholt two-spindle brake-drum Superfinisher turned to a surface roughness of approximately 150 microinches RMS, and are finished to 30-40 microinches RMS.

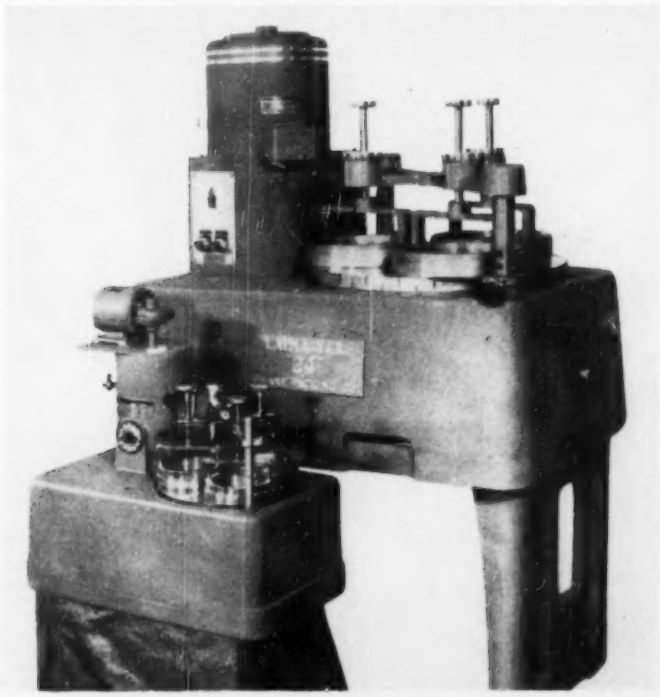




BROACH SHARPENER — *Colonial Broach Co., Detroit 13, Mich.* Step-Stop Micro-feed cuts broach sharpening time 25%. Universal Broach Sharpener, Model No. CS-36, is designed for sharpening of both internal and surface broaches in lengths up to 36 in. and as large as 6 in. in dia.



HONING MACHINE—*Micromatic Hone Corp., Detroit, Mich.* Honing machine features the Micromatic gage bar, Microsize head and tool. Diesel liners 5.75 in. in dia. and 15 in. long are being honed and automatically sized.



LAPPING MACHINE—*Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.* Applicable to production runs or individual jobs, the Lapmaster is designed to handle work of various sizes and shapes in one operation. Combined workholders and conditioning rings continuously maintain the desired lapping-plate surface to accuracies within 0.000016 in.

HYDROHONER — *Micromatic Hone Corp., Detroit, Mich.* Featuring sensitive controls and simplicity of operation, the Model 735 Hydrohoner handles small-diameter parts. Tolerances to millionths of an inch are held.

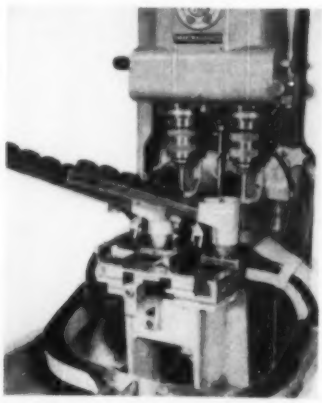
GRINDING, POLISHING MACHINE —*Delta Mfg. Div., Rockwell Mfg. Co., 600 East Vienna Ave., Milwaukee 1, Wis.* H-type grinding, polishing, and deburring machine uses coated abrasive belts instead of wheels, is portable, and is adaptable for use of two different quality grit belts at the same time.

GRINDER BELT—*Harvey L. Ramsey & Co., 636 S. 10th Ave., La Grange, Ill.* The Expeditor belt grinder is mounted on an axis that centers at the motor shaft and is so constructed that one turn of a clampnut will set the abrasive belt at any angle.

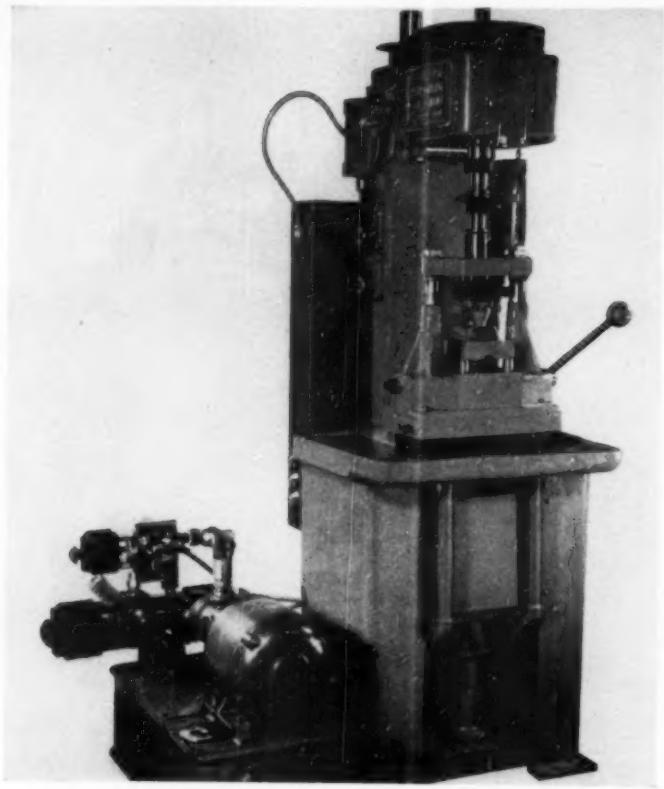
HONING MACHINE — *Micromatic Hone Corp., Detroit, Mich.* Honing machine is automatic, quill-type, adapted to hone valve guides. Guides are straight and round; size is held within 0.0003 in. on diameter. Production is 250 parts per hr.

HONING MACHINE — *Staple Engineering Co., 1315 S. Woodward Ave., Birmingham, Mich.* Model B7 vertical honing machine is adaptable to work having inside diameters ranging from ½ to 4 in., and up to 6 in. long. It is hydraulically operated and electrically controlled ↓

LAPPING MACHINE — *National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Operating on the diagonal-lapping principle, which usually requires only two passes and is faster than conventional lapping, the Red Wing diagonal lapping machine is reported to be capable of correcting gear errors of greater magnitude than conventional machines.



HONER—*Microhone Corp., Detroit, Mich.* Hydrohoner is a double-spindle machine equipped with Microsize automatic sizing. Hardened gears are fed into a magazine, then automatically dropped into position in fixture, honed, and ejected.



AMERICAN MACHINIST 37TH ANNUAL REVIEW

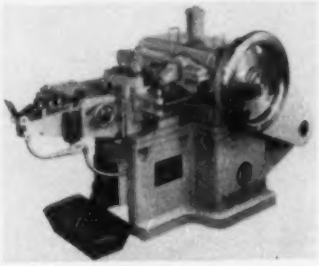
Cutoff and Filing

CUTOFF MACHINE—*Grob Brothers, Grafton, Wis.* Vertical-type cutoff machine has a capacity of 18x18 in. Cutting cycle of the machine is automatic.

CIRCULAR-SAWING MACHINE—*Motch & Merryweather Machinery Co., Penton Bldg., Cleveland, Ohio.* The No. O-H circular-sawing machine handles stocks to 4 in., round or square. →

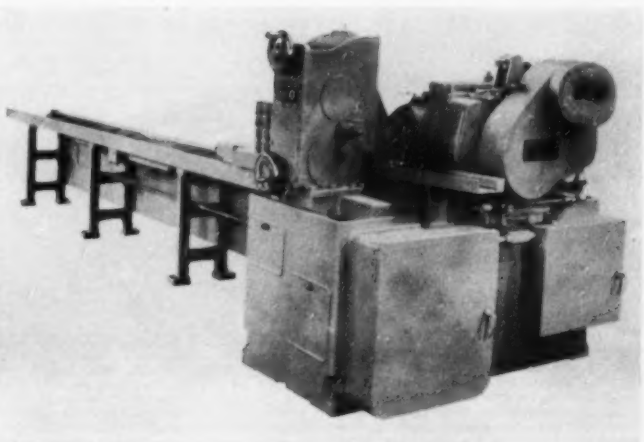
TUBE CUTOFF—*Continental Machine Co., 1960 Maud Ave., Chicago 14, Ohio.* Rotary pipe and tube cutoff wheels are available for all makes of cutoff machines. Disks in 7-in. dia, 3/16 in. and ⅛ in. thick are carried in stock.

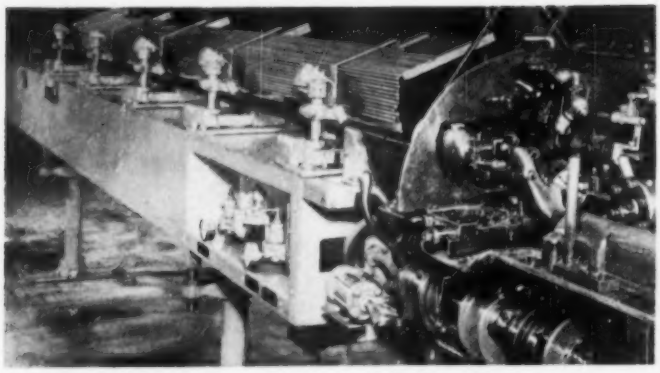
PIPE SAW—*The E. H. Wachs Co., 1525 N. Dayton St., Chicago 22, Ill.* HSS milling cutters leave clean milled edges on 12- to 48-in. CI or steel pipe cut with this portable air-powered machine.



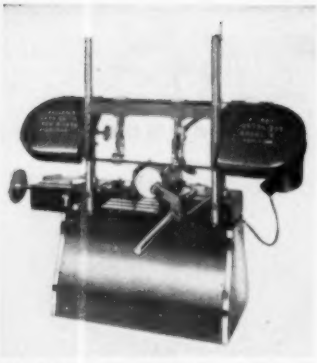
NAIL CUTTER — *Black Industries, 1400 E. 222nd St., Cleveland 17, Ohio.* Taking the place of Models GA and EA, the Black Model GB wire nail-making machine makes all popular sizes of large-head roofing nails.

BAND CUTTER—*The DoAll Co., Des Plaines, Ill.* Employed to cut every known solid, the DoAll Contour-matic is equipped with a stepless variable-speed device and has a speed range of 40 to 10,00 fpm.



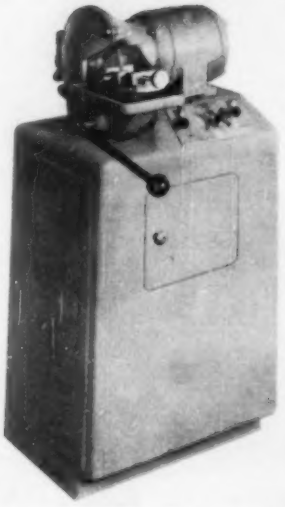


BAR-FEED LOADER—*Lipe-Rollway Corp., Syracuse 1, N. Y.* Automatic magazine-loading pneumatic bar-feed unit can feed from 0- to 18-in. lengths of stock ranging in diameter from ⅛ to ⅝ in. Magazine capacity is 19⅝-in. bars and up to 96¼-in. bars.



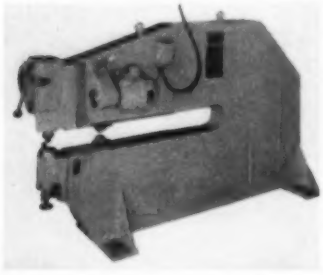
BANDSAW—*W. F. Wells, North on 131, Three Rivers, Mich.* Cutting head of the Model M metal-cutting bandsaw is a one-piece welded construction which includes beams for blade guides and column housing. Saw capacity is 9x18 in., and maximum clearance under the saw blades is 20 in.

PORTABLE BANDSAW—*Kalamazoo Tank & Silo Co., 560-508 Harrison St., Kalamazoo, Mich.* Equipped with a hydraulic dashpot mechanism to insure controlled constant pressure from beginning to end of cut, the No. 610-S portable bandsaw cuts angle bars, tubes, and pipes up to a capacity of 6x10 in.

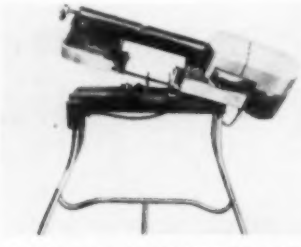


CUTTING UNIT—*Buehler Ltd., 165 W. Wacker Drive, Chicago 1, Ill.* Cutoff machine No. 1010 AB is a 1-hp laboratory-size cutting instrument with ample power for fast cutting of samples up to 1-in. dia.

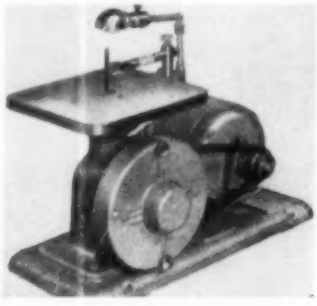
BANDSAW — *Tyler Manufacturing Co., 6151 West 98th St., Los Angeles 45, Calif.* The Tyler bandsaw with a spiral blade cuts steel, plastics, and foam rubber. The blade presents a 360° cutting edge that cuts smoothly in any direction.



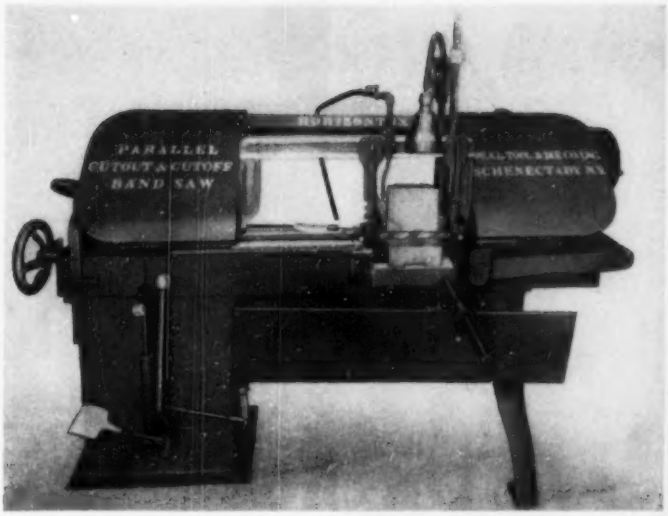
CUTTING MACHINE—*Pullmax Co., 5222 North Spaulding Ave., Chicago 25, Ill.* Pullmax Sheet and Plate Working Machine does beading, folding, and straight, circular, or design cutting of metal to ⅝-in. thickness. Cutting tools shear the metal to the breaking point.



PORTABLE BANDSAW—*Wells Mfg. Corp., 505 Roosevelt Road, Three Rivers, Mich.* Model 49A has a capacity of 3½ in. for rounds and 3½x 6⅝ in. for rectangular shapes. The blade is driven by a 1/6-hp ball-bearing motor with manual start and automatic stops.

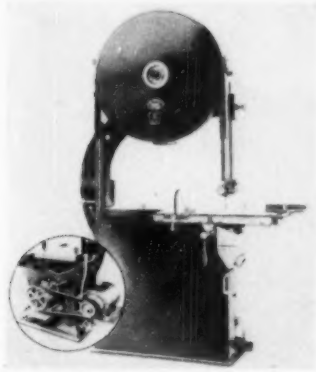


DIE FILER—*Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles, Calif.* Available with either ⅛- or ¼-in. shank file, this die filer has a stroke length variable from 3/16 to ¾ in. The 8½-in. square table tilts front and back.

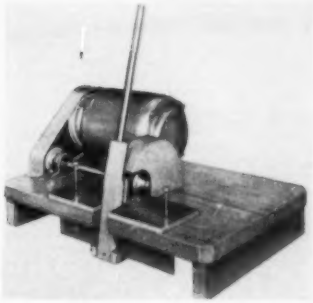


BANDSAW—*Ideal Tool and Die Co., Inc., 733-35 Congress St., Schenectady 3, N. Y.* A horizontal saw, the Horizontex No. 8 parallel cutout and cutoff bandsaw, offers cutting action always parallel to the bed from start to finish. A scale on the post is numbered from 0 to 8 in. for gaging depth of cut.

BANDSAW CONVERTER—*The Erwood Co., 21½ Woodstock St., Crystal Lake, Ill.* The Plani-Drive converts wood-cutting bandsaws to cut such metals as aluminum, copper, brass, iron, and steel.

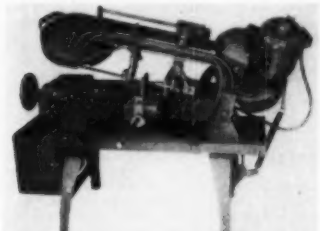


BANDSAW—*The Moak Machine and Tool Co., Port Huron, Mich.* High-speed bandsaw with heavy-duty 4-speed transmission is for cutting metals and alloys and gives a choice of operating speeds from 150 to 1200 rpm.

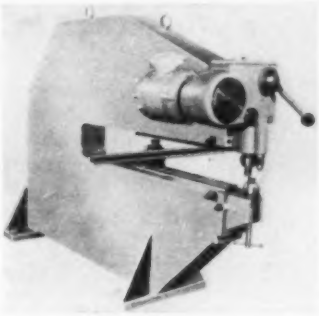


HOSE CUTTER — *Aeroquip Corp., Jackson, Mich.* Small enough to mount on an ordinary shop bench the Aeroquip hose cutoff machine can cut all types of flexible hose including that reinforced with plies of wire braid.

BANDSAW — *Walker-Turner Div., Kearney and Trecker Corp., Plainfield, N. J.* This 12-in. bandsaw Model BW740 has a capacity, blade to frame, of 12 in. and guide to table 7-in. max. The frame and body are of a unique 3-piece cast-iron design.



METAL-CUTTING BANDSAW—*Wells Mfg. Corp., 505 Roosevelt Road, Three Rivers, Mich.* The Wells-O-Bar Feed Master converts horizontal metal-cutting bandsaws into fully automatic cutoff machines. This unit makes multiple-cutting action completely automatic.



CUTTING MACHINE—*The American Pullmax Co., Inc., 2627 North Western Ave., Chicago 47, Ill.* Pullmax Model P-5 sheet-steel and plate-cutting machines are capable of straight, circular, and irregular cutting, in addition to ← folding, beading, and slotting.

CUTOFF and FILING

FLASH-TRIMMING MACHINES—*Morton Mfg. Co., Muskegon Heights, Mich.* High-production flash-trimming machine is especially arranged for removing the flash or upset from strip stock or cylinders up to 4-in. maximum width and 3/32-in. maximum thickness.

CONTOUR MACHINE—*Boice-Crane Co., 935 Central Ave., Toledo 6, Ohio.* With blade speeds ranging from 92 to 4100 fpm, this portable combination contour saw and band filer is said to permit great time saving in cutting, filing, and file broaching on small-run production and maintenance parts.

CUTOFF MACHINE—*Stone Machinery Co., Inc., 333 Fayette St., Manlius, N.Y.* With capacity of 3-in. solids or 4-in. pipes in both ferrous and nonferrous metal, the Stone "Swing-Cut" abrasive cutoff machine eliminates all belt drive with a 5-hp geared-in-head motor.

BOLT CUTTERS—*Manco Mfg. Co., Bradley, Ill.* Special centercut bolt cutter has chisel-type jaws. Jaws are of forged tool steel permitting cutting of case hardened bolts, chain, reinforcing rod, and other hard materials.

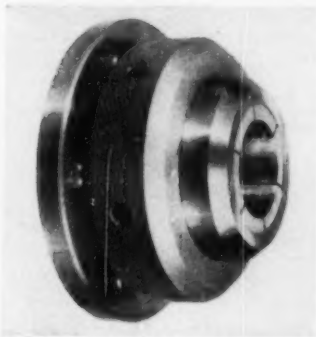
BANDSAW FIXTURE — *Columbus Special Machine Co., Columbus, Ind.* Hamilton automatic bandsaw fixture permits a circle feed in diameters from 5 to 18 in., cutting material up to 2-in. thick.

HACKSAW—*Machine Rebuilding Co., 2742 Chene St., Detroit 7, Mich.* Rigid hacksaw is designed as a precision tool. A one-piece steel-tube back enables the blade to be tightened to high tension.

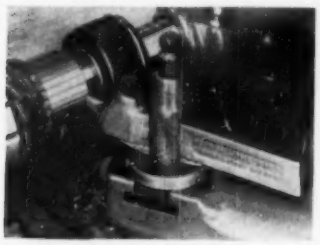
PIPE-CUTTNG MACHINE — *Oster Mfg. Co., 2057 E. 61st St., Cleveland 3, Ohio.* Sixty pieces of 2-in. or 150 pieces of ½-in. pipe can be cut off in 10 min with the No. 662 Cut Master. The machine will handle pipe from ¼- to 2-in. diameter.

SPLINE-BURRING MACHINE—*Sheffield Corp., Dayton 1, Ohio.* Flytool machine for burring a spline where the adjacent shaft diameter approaches the root diameter of the spline can be used for either involute or straight spline.

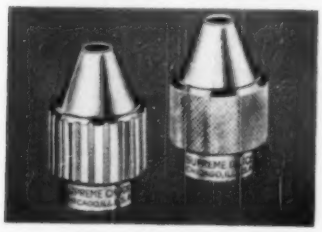
Tools and Accessories



CHUCK—*Erickson Tools Div., 2311-A Hamilton Ave., Cleveland 14, Ohio.* Every part of this Standard faceplate collet chuck except the knurled spanner lock nut is of non-magnetic conductor material.



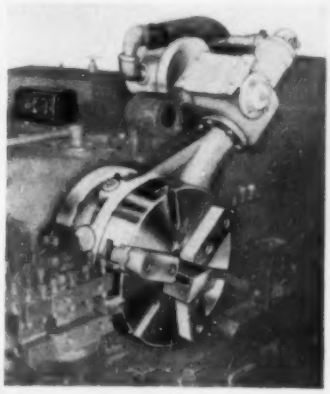
CHUCK—*South Bend Lathe Works, South Bend 22, Ind.* The South Bend adjustable collet bushing chuck accommodates centerless shafts from ¼- to 1-in. dia, concentrically in lathes.



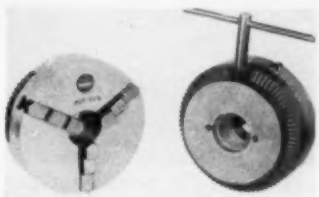
HAND-LOCK CHUCKS — *Supreme Products Inc., Chicago, Ill.* Supreme "Hand-Lock" chucks are available in both serrated and knurled models, each with ¼-in. capacity. They are made in ¾-24-thread, ½-20-thread, and ½-24-thread sizes.

CHUCK—*L-W Chuck Co., 25 S. St. Clair, Toledo, Ohio.* Five-in. medium-duty universal chuck has two sets of jaws and features three separate pinions instead of the usual single pinion.

CHUCK — *The Whiton Machine Co., New London, Conn.* The Whitaloy chuck is forged of a special-analysis heat-treated aluminum alloy considerably reducing weight.



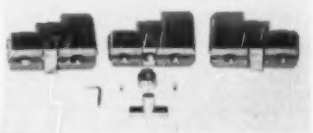
CHUCK—*The Whiton Machine Co., New London, Conn.* The Air-O-Torque chuck features center hole and instant jaw action. The heavy-duty power chuck combines the features of both an air-operated chuck and power wrench-operated chuck.



CHUCK—*Westcott Chuck Co., Oneida, N.Y.* Said to combine the speed of a lever-operated chuck with the powerful grip of a pinion-operated unit, the Westcott 75 three-jaw universal chuck has solid reversible jaws.

CHUCK WITH RECTIFIER—*The Hanchett Magna-Lock Corp., Big Rapids, Mich.* Magna-Lock HR-510-0 magnetic chuck and rectifier combination is suited for small machines and for bench work. It has a 5x10-in. working surface and is 4 in. high.

LATHE CHUCK — *Jacobs Mfg. Co., West Hartford 10, Conn.* Providing gripping power reported to be from 2 to 4 times that of chucks with split-steel collets, the Jacobs spindle-nose lathe collet chuck employs Rubber-Flex variable-size collets. These collets have a ⅛-in. gripping range.



CHUCK JAW—*Whiton Machine Co., New London, Connecticut.* An eccentric bushing with adjusting screws on the Tru-Loc Top Jaw allows adjustment of the top jaw up to 1/32 in. by manipulation of two adjusting screws.

JAW CLAMPS—*J & S Tool Co., Inc., 477 Main St., East Orange, N. J.* Jaw clamp is designed for holding almost every size and shape of workpiece against the faceplate or table of a machine.

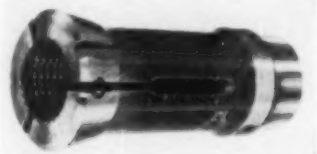
CHUCK—*The O. S. Walker Co., Inc., Worcester, Mass.* Standardization of the Walker 16-in. rotary permanent-magnetic chuck has resulted in an increase of from 5 sizes of permanent chucks to 25 sizes available.

MAGNETIC CHUCK—*Omer E. Robbins Co., 5722 Twelfth St., Detroit 7, Mich.* Series 20, for production surface grinders, has a permanent magnetic chuck measuring 7½ x 20½ in. and can be used for either wet or dry grinding.

COLLET CASE — *Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 23, Ohio.* Designed to cut down time loss due to misplacing of tools, this case contains a complete set of 5-C collets.

AIR-OPERATED COLLET—*Hardinge Bros., Inc., Elmira, N. Y.* Model AC50 high-speed precision second-operation machine offers an air-operated collet. In operation, the machine operator closes and opens the collet by actuating a pedal.

COLLETS—*Hardinge Bros. Inc., Elmira, N.Y.* Hardinge stop collets for Brown & Sharpe machines come equipped with either solid stops or spring ejector stops.

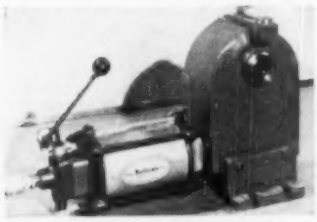


CLOVERLEAF GRIND—*The Sheffer Collet Co., Traverse City, Mich.* The Cloverleaf grind on the external bearing surfaces of all collets provides a cam relief at the slots enabling a positive bearing in the center of each jaw section.

COLLET CHUCK—*Goodwin Mfg. Co., 10 E. Broadway, Cuyahoga Falls, Ohio.* A quick-acting collet chuck, suitable for use on milling machines, can be mounted on the index plate in either vertical or horizontal position for semi-automatic milling and slotting operations.

COLLET—*The Monarch Machine Tool Co., Sidney, Ohio.* Developed to reduce operator fatigue on long production runs, the Monarch air-operated collet attachment is said to increase the output of this company's 10-in. precision manufacturing lathe and its Speed-Matic hand-operated screw machine.

COLLETS—*Wade Tool Co., Waltham, Mass.* Wade collets are now offered with threads ground from the solid after hardening, providing against possible distortion in thread pitch or in thread shape.



COLLET CHUCK—*The Bellows Co., Akron, Ohio.* Holding power of the Bellows BZC-10 "Controlled-Air-Power" collet chuck is said to be sufficient to withstand severe drilling, tapping, and milling without fear of the workpiece slipping or twisting.

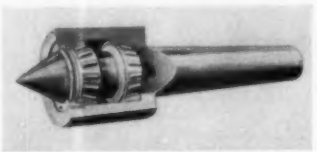
COLLET CHUCK—*Erickson Tools Div., 2311 Hamilton Ave., Cleveland 14, Ohio.* An automatic spring-actuated collet chuck, with cam-released setup, speeds up polishing, grinding, and other machining operations.

TIPS—*Diamonds and Tools, Inc., Div. of Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.* Colmonoy wear-resistant tips can be silver soldered to the wear end of lathe or grinder centers which are worn back too far for further grinding.

WORK-HOLDING DEVICES—*Layne-Held Corp., 2005-B South Shelby St., Higginsville, Mo.* In-R-Tool work-holding device is for use in lathes, vises, boring mills, machine tables and fixtures, and electric drills and drill presses. It is said to hold narrow tolerances in machine shops.

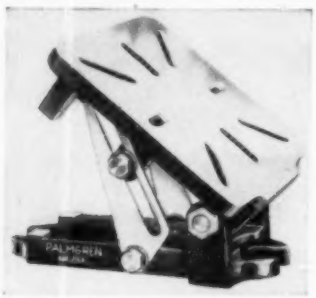
SURFACE PLATE ACCESSORIES—*South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* Precision ground plate is made with close-grained iron of high wear resistance, and is heat-treated to prevent distortion. Toolmakers' V-blocks are made of hardened steel.

LATHE CENTERS—*South Bend Lathe Works, South Bend 22, Ind.* Available with standard No. 2 and No. 3 Morse taper shanks South Bend lathe centers' 60° tungsten-carbide tips are said to be much harder than the hardest tool steel point.



LIVE CENTER—*Scully-Jones & Co., 1901 South Rockwell St., Chicago 8, Ill.* Two matched Timken tapered roller bearings in the Scully-Jones live center have eccentricity points aligned for perfect anti-friction rotation. Carrying capacities up to 2400 lb in No. 4 and 5 Morse taper sizes are reported.

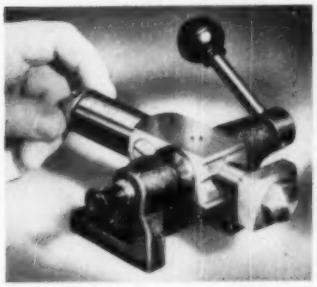
LIVE CENTERS—*Montgomery & Co., 53 Park Pl., New York 7, N. Y.* Ball-bearing construction of the Montgomery live center eliminates burning and regrinding and permits them to take a thrust load up to 60,000 lb.



ANGLE PLATES—*Chicago Tool & Engineering Co., 8383 South Chicago Ave., Chicago 17, Ill.* Palmgren adjustable angle plates are for setting up jobs difficult to hold in a vise.

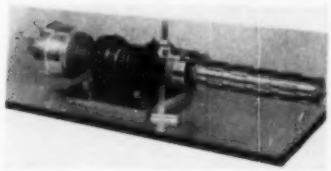
CLAMPS—*Universal Vise & Tool Co., Parma, Michigan.* The Col-Vise clamps to the column of single- or multiple-spindle drillpresses. Position of the vise is adjustable both angularly and radially.

VISE—*Matco Tool Co., 2830-36 W. Lake St., Chicago 12, Ill.* Cradle of this all-angle precision vise has a 90° range, 45° each side of horizontal. Sizes are 3½- and 4½-in. width of jaw.



MICRO-VISE—*Metal Items, Racine, Wis.* Consisting of two units, a vise and a base fixture, the micro-vise is a precision tool for holding small parts.

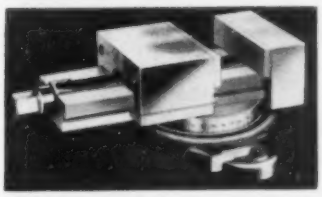
VISE—*J. H. Williams & Co., 400 Vulcan Street, Buffalo 7, N.Y.* With special aluminum-alloy base which has high tensile and impact properties, the Williams lightweight combination vise, stand, and pipe bender handles from ⅛- to 2-in. pipe.



FIXTURE—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Rotating checking fixture for tubing was designed to maintain high degree of concentricity in wall-thickness inspections. Fixture includes a precision multiple-sleeve mandrel operated by an air cylinder.

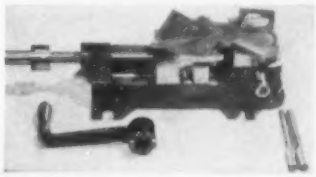
CLAMPS—*Noble & Stanton, Inc., 717 Broadway, Bedford, Ohio.* Series No. 250 Midget-type clamps have been designed to locate small parts during machining operations. Three models are available, each with a different clamping arrangement.

WORK POSITIONER — *Solon Foundry, Inc., 1510 University Road, Cleveland 13, Ohio.* The Positionette is a lightweight, self-contained work positioner. The table is adaptable to practically all sizes and shapes of fixtures and is used as a soldering base and angle plate.



MACHINE VISE—*South Bend Lathe Works, 378 E. Madison St., South Bend 22, Ind.* Swivel vise which holds work on machine tools has a maximum jaw opening of 4 in. and swivels 90° to right or left.

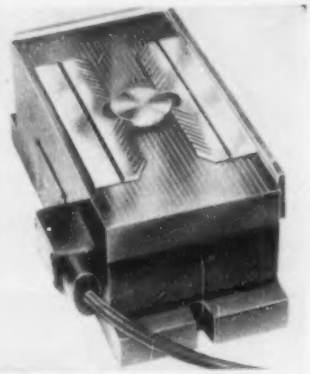
VISE—*En Fab Inc., 338 Parsons St., Kalamazoo, Mich.* Joints of this compound-angle vise swing 180° in either direction and are adjusted by socket-head screws. Materials up to 1½ x 2½ in. can be held in the unit.



UNIVERSAL VISE—*Porath & Magneheim Inc., 95 Liberty St., New York 6, N.Y.* To cope with odd-shaped work, the "Savo" universal screw vise has three hinged jaws, each of which is divided into several independent layers.

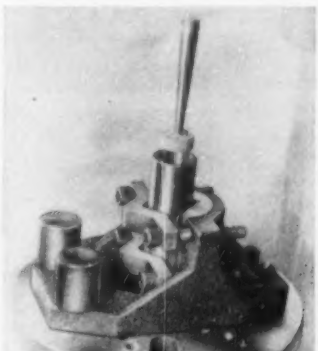
AIR-POWERED VISES — *Van Products Co., 1521 Erie Trust Bldg., Erie, Pa.* Vi-Speed vises are air powered and foot controlled. They operate on 15 to 150 psi air-line pressure.

SAFETY PARALLEL UNITS—*Acro Die & Stamping Co., 5328 N. Kedzie Ave., Chicago 25, Ill.* Safety parallel unit is said to eliminate makeshift methods of supporting tools, dies, jigs and similar work. It is available in 3-, 5- and 7-in. heights, with a 20-in. spread.

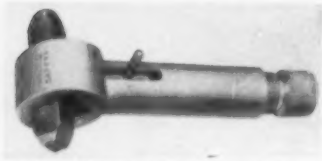


CLAMPING DEVICE — *Hanchett Magna-Lock Corp., P. O. Box 816, Big Rapids, Mich.* The "Magna-Vise" consists of a pair of magnetically actuated clamps that hold non-magnetic work parts against the face of a magnetic chuck for machining purposes.

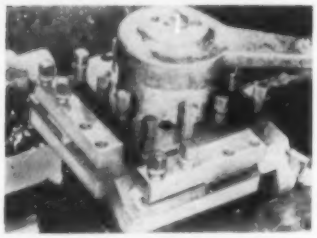
WORK POSITIONER—*Ransome Machinery Co., subsidiary of Worthington Pump and Machinery Co., Dunellen, N. J.* Unit is motor-operated and driven by a hydraulic variable-speed transmission and a ½-hp single-phase ac motor.



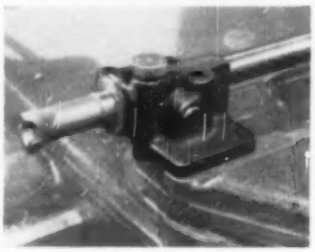
WORKHOLDER—*Lassy Tool Co., 96 Bohemia St., Plainville, Conn.* Quick accurate setups on lathes, grinders, jig borers, milling machines, and drill-presses are provided with this workholder. Work can be held to tolerances of 0.0002 in 3 in.



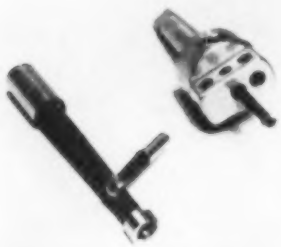
TOOLHOLDER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh, Pa.* The M. E. Cunningham "Safety" hand toolholders are constructed of lightweight cast aluminum, and are available in size ranges from ¼ in. to ½ in. to ¾ in. to 1¼ in.



TOOLHOLDER—*Rusnok Tool Works, 4840 W. North Ave., Chicago 39, Ill.* Adaptable to turret lathes and other lathes with square tool posts, this toolholder enables shops to standardize on one size tool at a lower cost.



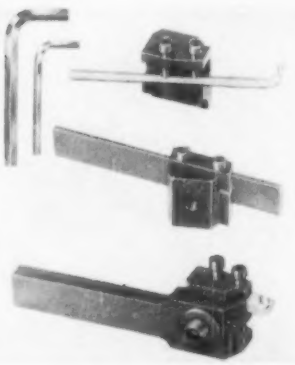
LATHE TOOLHOLDER—*Bokum Tool Co., Detroit, Mich.* The adjusting screw on the top of this boring-tool holder provides vertical adjustment for boring or internal-threading tools over a distance of ¾ in.



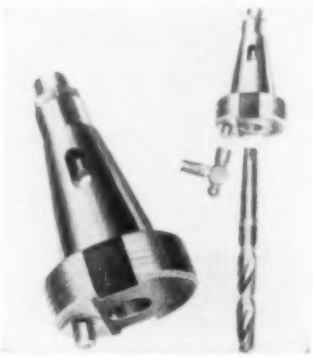
BORING BAR—*A. B. Craley & Son, Clementon, N. J.* This free-cutting boring bar has twice the amount of usable head with the same diametral clearance, and can be used as a double-end cutter where holes are to be reamed to size.

TOOLHOLDERS—*Carboloy Co., Inc., Detroit 32, Mich.* For use where it is desired to incorporate special angles, Carboloy has developed special holders for insert tools.

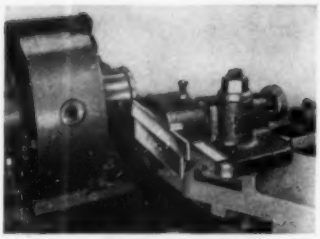
TOOLHOLDER—*American Die & Tool Co., Reading, Pa.* A lock block, screw, and lock nut arrangement on the Ready Rigid tool holder clamps the carbide bit against the work surface with rigidity and is said to eliminate "shaking loose" under extreme vibrating conditions.



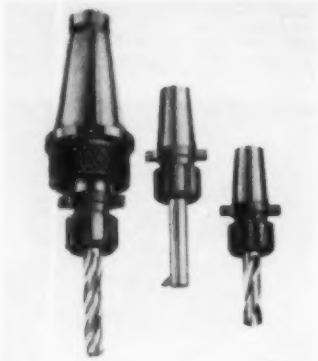
LATHE TOOLHOLDER—*Brand Tool & Supply Co., 2411 West Magnolia Blvd., Burbank, Calif.* Toolholder with true vertical adjustment for turning, facing, threading, boring, or cutoff operations consists of a shank for standard toolposts with three heads for mounting toolbits, cutoff tools, and boring bars.



MILLING MACHINES ADAPTER—*Greenville Tool and Die Co., Greenville, Mich.* Rotary adapter for milling machines is for quick change of tools. Tools are ejected by tapping the release button located on face of adapter.



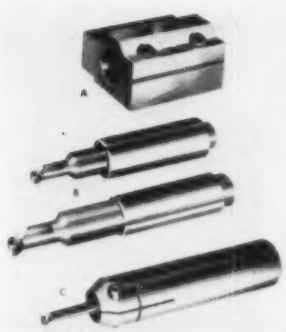
TOOLHOLDER—*The Biggstava Co., 3357 Union Pacific Ave., Los Angeles 23, Calif.* The K-J quick-change cutoff toolholders for engine lathes allow the cutoff tool to rest on a supporting blade which is slightly concave along the top edge, while the lower edge is convexed to fit.



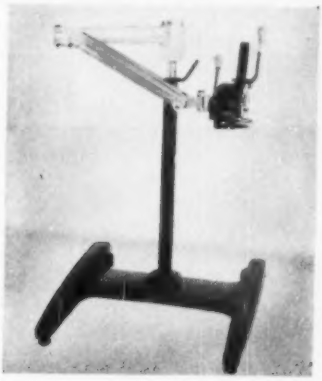
TOOLHOLDER—*Universal Engineering Co., Frankensmuth, Mich.* Kwik Switch toolholder permits rapid change of tools on jobs requiring multiple operations such as drilling, tapping, and boring. Changes are said to be possible in less than 10 sec, without loss of close-tolerance accuracy.

COLLET-HOLDING UNIT — *H. B. Rouse & Co., Chicago 14, Ill.* Spline cutting, cross slotting, small-screw slotting, slitting, and a variety of other machining operations can be handled on smaller machines by use of the Rouse No. 9 collet-holding unit.

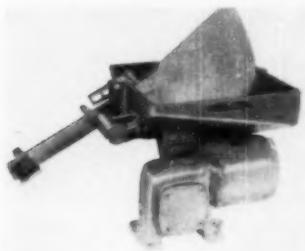
TOOLHOLDER — *The Maxwell Co., Bedford, Ohio.* Designed to perform automatic recessing operations on high-speed automatic machines, this Auto-Recess toolholder can be attached quickly and easily to automatic machine toolholders.



HOLDER—*Bokum Tool Co., Detroit, Mich.* Holder A, designed for single-point boring tools on lathes has a theoretical range of diameters from 1/16 to approximately 4 in. with the aid of shanks and adapters.



TOOL MOUNT—*Acme Steel Co., Strapping Div., Chicago 8, Ill.* The Acme E5 universal tool mount has rubber casters, four leveling screws, and a 17-in. vertical movement without post adjustment.

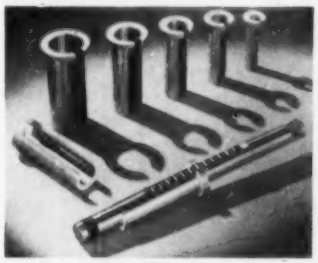


HOPPER FEED—*Feedall Machine and Engineering Co., 70 Vine St., Willoughby, Ohio.* Automatic hopper feed, Model H-500, is a self-contained feeding unit powered by a ¼-hp gear motor. The hopper will feed different types of work such as bolts and screws.

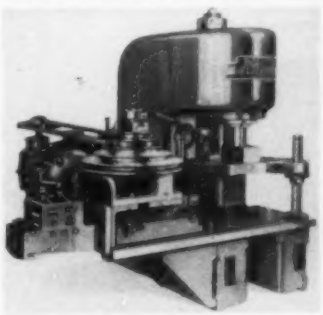
HOPPERS—*Kraus Design Inc., 41 S. Water St., Rochester 4, N. Y.* These hoppers are for the automatic feeding of a variety of parts.

TAP HOLDER—*Burg Tool Mfg. Co., 5028 W. Jefferson Blvd. Los Angeles 15, Calif., Dept. C-4.* Tap holder for close-center, multiple-tapping operations, called Tool-Flex, will tap up to 10-24 in. steel at ⅞ in. center to center.

EXTRACTOR—*L. C. Ball Associates, 2276 National Bank Bldg., Detroit 26, Mich.* The Ez-Pul pierce die "button" extractor pulls straight or taper hole inserts without removing dies or die sections from the press.

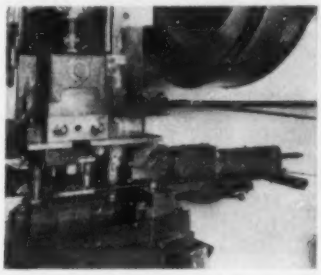


ADAPTERS—*Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Line of eccentric bushing-type adapters is developed for use with standard ⅝-, ⅞-, ¾-, 1- and 1¼-in. Glenny broaches. One size broach can cut accurate keyways in six different diameter bores.



STOCK FEED — *The Denison Engineering Co., 1160 Dublin Road, Columbus 16, Ohio.* Automatic feeding of stock strip to punching dies by this Harmonic stock feed accessory, steps up production to as high as 50,000 pieces per hr.

HYDRAULIC FEED MACHINE — *Moline Tool Co., Moline, Ill.* Moline MR131 special two-way, four-unit, horizontal, hydraulic-feed machine tapers, reams, chamfers, and taps a variety of sizes of pipe couplings. Clamping jaws can be installed in the fixture to hold 2½-, 3-, or 4-in. pipe couplings.

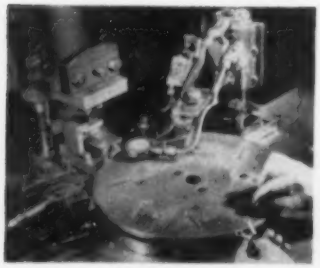


PUNCH-PRESS FEED—*H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass.* The Rol-Di-Feed, an automatic punch-press feed, is a self-contained cam-driven feed which is installed on the press bolster, and in some cases directly on the die shoe, to feed stock in any direction.

HOPPERS—*Kraus Design Inc., 41 S. Water St., Rochester, N.Y.* Each of these five Kraus hoppers was designed for specific purpose. They feed oriented parts into nests for special assembly machines.

BAR FEED — *Jones & Lamson Machine Co., Springfield, Vt.* Hydraulic bar feed and collet-chuck mechanism is for continuous high-speed turning with carbide tools. Single-lever control panel provides finger-tip control of the complete cycle for the operator.

ROLL FEEDS—*U. S. Tool Co., Inc., Ampere (East Orange), N. J.* Roll feed is equipped with automatic starting and roll-release mechanism. Operator raises upper roll of the feed into a locked position using handle.

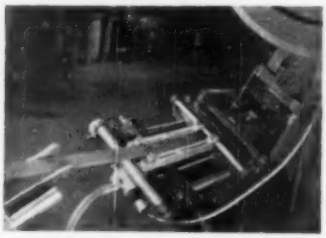


FEEDING DEVICE—*V & O Press Co., Div. of Rockwell Mfg. Co., Hudson, N. Y.* Feed-O-matic punch-press feeding device transfers parts from a nesting plate to a standard punch-press die by means of a mechanical hand or a vacuum pick-up.

COIL CRADLES—*Rowe Tool & Die Co., 1606 North Industrial Blvd., Dallas, Tex.* The Easy Load motor-driven automatic coil cradles are made in two sizes. The 300-lb model handles coil stock up to 36-in. OD to 10-in. widths and the 330-lb model has a 40-in. OD coil stock capacity.

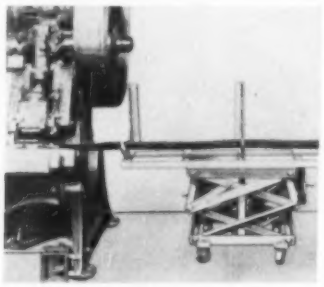
AUTOMATIC DIAL-INDEX—*De Castro & Associates, 2477 Randolph St., Huntington Park, Calif.* Speedex automatic dial-index feed for punch presses has standard table 12 in. in diameter. The table can be adapted to any ordinary punch press without altering the press.

STOCK STOPS—*Balas Collet Mfg. Co., Dept. AM, 1557 E. 27th St., Cleveland 14, Ohio.* Stock stops, with Carboloy faces and shanks, are hardened to avoid nicking or scratching by the clamping mechanism. They can be inserted into the turret and are thus not limited as to distance.



AIR-FEED UNIT — *Great Western Tools Inc., 3811 Riverside Drive, Burbank, Calif.* Feedmaster air-feed unit feeds sheets, channels, bars, etc., in a wide range of thickness and widths. The unit weighs 50 lb and can be attached to punch presses, drillpresses, or spotwelders and can be operated at 300 strokes per min.

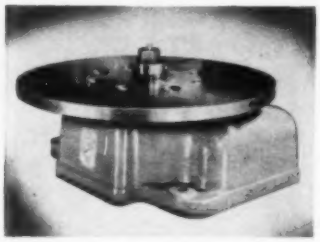
INDEXING FIXTURE—*Vinco Corp., 9111 Schaefer Highway, Detroit 28, Mich.* With guaranteed indexing accuracy of within 30 sec of the arc, the Precision-dex is adaptable to such operations as jig boring and grinding, light milling, surface grinding, drilling, engraving, profiling, light shaping, graduating, slotting, and inspection.



SHEET-FEEDING ATTACHMENT — *Montgomery & Co., Inc., 53 Park Place, New York 7, N. Y.* Tilting sheet-feeding attachment for company's elevating table is made of steel and has eight angular adjustments up to 45°.

FEED STOP — *Dahlstrom Mfg. Co., 2520 W. Larpenteur Ave., St. Paul, Minn.* The Autostop is an adjustable automatic stock-feed stop which will work with blanking, progressive, or compound dies.

INDEX TABLE—*Westinghouse Electric Corp., Sunnyvale, Calif.* Adjustable table for a rotary drillpress makes it possible to speed up drilling different types and sizes of holes in various steel plates and housings on high-volume jobs about 60%.

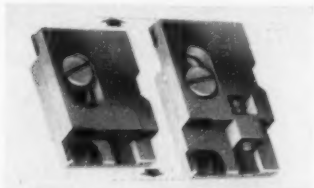


INDEXING FIXTURE — *Ettco Tool Co. Inc., 59½ Johnson Ave., Brooklyn 6, N.Y.* Table-indexing motions of the Ettco-Emrick No. 97 electric indexing fixture are controlled electrically through a modified Geneva system. This unit can be used for punch-press, tapping-machine, drillpress, and similar operations.

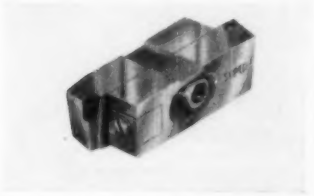
STOCK PUSHER—*Sheffer Collet Co., Traverse City, Mich.* A one-piece insert replaces the separate segment pads employed in master pushers. No special wrenches or other devices are required for holding the single solid insert.

DIAL-FEED TABLES—*A. K. Allen Co., 495 Wythe Ave., Brooklyn 11, N. Y.* The Model 11 DA and 11 DB double-acting dial-feed tables have a 2¼-in. dia double-acting cylinder and are said to have more than three times the power of the single-acting model.

TOOLS — *The Nelco Tool Co. Inc., Manchester, Conn.* Line of stress-relieved carbide-tipped tools of the Nelco slash-milled design eliminates brazing strains.



EXPANSION BLADE—*Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Carbide-tipped adjustable expansion blade is for standard reamers and boring bars. Standard sizes up to 4 in. are available.



ROUGHING BLADE—*Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Carbide-tipped roughing blades for boring bars expand up to 4 in. It is expanded by loosening the set screw.

CARBIDE-TIPPED TOOLS — *Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Line of seven types of carbide-tipped tools for turning, boring, facing, and threading in a wide range of sizes includes both left- and right-hand styles in side-cutting types.

CUTTING-TOOLS — *Plew Tool & Metal Heat Treat, Columbia City, Ind.* Subjected to a series of high and low heat treatments in sequence, and containing approximately 13% cobalt, "Lucky-13" cutting-tools are said to have hardness of C 66-68 and tensile strength of over 300,000 psi.

CARBIDE TIPS—*Carboloy Co., Inc., Detroit 32, Mich.* No. 905 grade Carboloy-cemented carbide is for finishing and light roughing cuts on non-ferrous metals and cast irons with hardness up to Brinell 550.

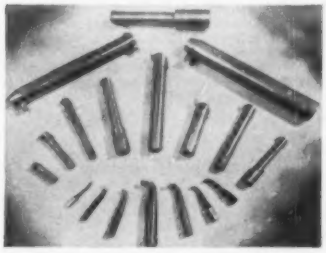
SOLID-CARBIDE BLANKS — *Carboloy Co., Inc., Detroit 32, Mich.* Line of seven sizes of standardized solid-carbide blanks for lathe and grinder centers range in price from $0.70 to $9.30. Center blanks range in diameter from 0.250 to 0.875 in.

SOLID-CARBIDE CYLINDERS—*Carboloy Co., Inc., Detroit, Mich.* Standardized line of solid-carbide cylinders, both ground and unground, at reduced prices in quantities of 50 and over is comprised of 115 sizes.

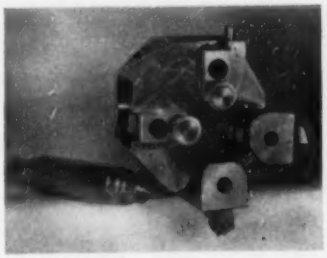
LATHE TOOLBITS — *The Dow Mechanical Corp., Thompsonville, Conn.* The Du-Bit lathe toolbit is manufactured with both lead clearance and point clearance formed in the blank. They are supplied in several standard high-speed steel grades.

OFFSET TOOLS — *Kennametal Inc., Latrobe, Pa.* Shanks for styles FRH and FLH Kennametal offset tools serve as permanent toolholders. The cutting edge is a mechanically held Kennametal tip which can be advanced and reground as it becomes dull.

TOOLS — *Kennametal Inc., Latrobe, Pa.* Styles VG and SVG tools are designed for machining grooves to the dimensions recently approved by the Multiple V-Belt Drive and Mechanical Power Commission Association.



FORGED BITS AND BORING BARS —*The Maxwell Co., 300 Broadway, Bedford, Ohio.* Line of forged bits and boring bars will fit any standard toolholder and are available for use in boring, facing, recessing, and other similar operations.



BOX TOOL—*Multi Micro Cut Tool Co., 3106—47th Ave., So., Minneapolis, Minn.* Multi Micro Cut Box Tool is designed for setup versatility to cut up to six different shoulder cuts and short lengths.

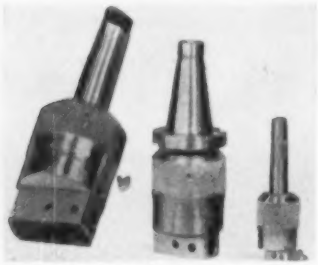
SPECIAL FORM TOOLS—*Johns-Hartford Tool Co., Box 314, Hartford, Conn.* A wide range of special form tools called the Micro-Keen Series made of cobalt high-speed steel, are said to increase the output and reduce cost of automatic screw-machine products.

RECESSING TOOLS—*The Maxwell Co., 386 Broadway, Bedford, Ohio.* Recess-O-Matic recessing tools are designed for use on multi-spindle automatics. Models 1½ DB, 2-DB and 3-DB have maximum capacities of 2, 3, and 4 in. respectively.

RECESSING TOOLS — *Maxwell Co., 386 Broadway, Bedford, Ohio.* Series "R" recessing tools have micrometer adjusting collars which facilitates recess-diameter control to within 0.001-in. or 0.050-in. per tool revolution.

RECESSING TOOL—*The Maxwell Co., 300 Broadway, Bedford, Ohio.* Large-size automatic recessing tool is designed especially for use on radial drills, boring mills, and large boring machines as well as drillpresses.

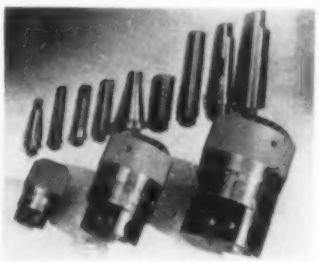
TOOL TIP—*Kennametal Inc., Latrobe, Pa.* For use in longitudinal-feed lathes, the Kennametal Style LRT roll-turning tool is intended to be set at an angle in the tool post to allow for the desired depth of cut.



BORING, FACING TOOLS—*The Maxwell Co., 386 Broadway, Bedford, Ohio.* The Series 40, E-Z set boring and power facing tools are available in three sizes which have cutter block travel of ⅝, 1⅝, and 2¼ in. respectively.

BORING BAR — *Rockford Precision Tool Co., 924 King St., Rockford, Ill.* Tools consisting of only two parts, a bar and a bit, are quickly assembled by means of a simple taper bit, eliminating use of setscrews or clamps. Taper bit assures rigid seating.

BORING TOOL—*Bokum Tool Co., Detroit 21, Mich.* Single-point boring tool, designed for greater precision in deep hole boring, is made of solid tungsten carbide.



BORING, FACING TOOLS—*The Maxwell Co., 399 Broadway, Bedford, Ohio.* E-Z-Set, Model No. 41 (15-in. max capacity) and Model No. 42 (20-in. max capacity) tools have been modified to include quick reversing.

TROUGH BORING—*Kennametal Inc., Latrobe, Pa.* The Style 16T brazed-on Kennametal-tip tool comes in two sizes: both are 1 in. wide and 12 in. long and heights are 1¼ and 1½ in.

CARBIDE CUTTERS — *The M. A. Ford Mfg. Co., Inc., Davenport, Iowa.* M. A. Ford line of carbide cutters has been increased to over 40 standard shapes.

CUTTER BLADES—*Hasley Products Co., 29706 Grand River Ave., Farmington, Mich.* Available in standard sizes up to 6-in. dia these high-speed reamers consist of high-cost cutter blades secured in recesses of a low-carbon-steel tool body by means of a rolling process.

MILLING CUTTER — *The Ingersoll Milling Machine Co., Rockford, Ill.* The Shear Clear face-milling cutter with carbide-tipped blades is for high-feed-rate milling of cast iron. This series is suitable for feed rates up to 75 ipm.

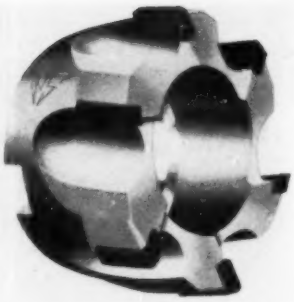
CARBIDE CUTTERS—*Severance Tool Industries, Inc., 726 Iowa St., Saginaw, Mich.* Carbo-Mill carbide cutters have ¼-in.-dia shanks and are made of solid carbide in one piece, cutting heads and shanks being integral.

MILLING TOOLS — *The Severance Tool Co., 726 Iowa St., Saginaw, Mich.* The Carbo-Mill tool line has been extended to include a ¼-in. shank set. It will be furnished in a Visi-case and comprises the ten most popular shapes.

SOLID-CARBIDE MILLS—*Severance Tool Industries Inc., Saginaw, Mich.* Seven different shapes are offered in the Severance 3/32-in. shank solid-carbide Carbo-Mill series. Materials up to 60 Rockwell C can be worked with these cutters.

END MILLS—*Lovejoy Tool Co., Inc., Springfield, Vt.* Carbide-tipped end mills and holders have positive-locking device to hold the mills immovable in the holder, while allowing end-wise adjustment and quick change of cutters.

END MILLS — *The Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland 14, Ohio.* Redesigned machine-polished flutes of this Cleveland end-mill line are said to give maximum cutting qualities at increased speed rates. Less breakage, more cuts per grind, and up to 50% increase in feed are reported.



END MILL — *Wendt-Sonis Co., Hannibal, Mo.* Equipped with carbide inserts, the Wendt-Sonis shell end mill is designed for facing or milling to a shoulder at high feeds and speeds.

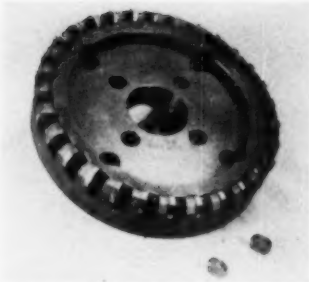
END MILLS—*Wendt-Sonis Co., Hannibal, Mo.* These tools are available in styles for machining all types of steel, non-ferrous materials, and cast iron.

END MILL — *Wendt-Sonis Co., Hannibal, Mo.* Completely formed from solid carbide, this tool is for production runs on close-tolerance slotting and keyway-cutting operations in cast iron, mild heat-treated steels and all types of non-ferrous, non-metallic materials.

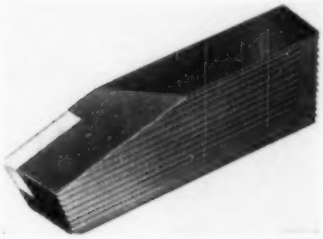
CUTTER—*Scully-Jones and Co., 1902 South Rockwell St., Chicago, Ill.* Available in 25 different sizes from 1½- to 3-in. dia, core-drill cutter of high-speed steel will remove approximately 45% its own diameter.

POINTING TOOL — *Boyar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* Universal adjustable pointing tool can be used for right- or left-hand jobs. Tool can be adjusted to compensate for misalignment between turret and spindle.

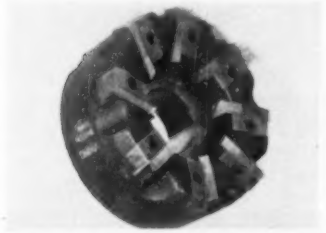
SCREW-MACHINE DRILL — *Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Heavy-duty, spiral-fluted, carbide-tipped drill is for hand and automatic-screw machines and chucking machines.



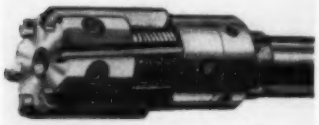
MILLING CUTTER — *Diamond Detroit, Inc., General Motors Building, Detroit, Mich.* Utilizing a solid-carbide octagonal-shaped blade, a new cutter has been designed for feed rates up to 60 ipm.



MILLING-CUTTER BLADES—*Kennametal Inc., Latrobe, Pa.* Serrated milling-cutter blades, having brazed-on Kennametal tips, produced to specifications in a wide variety of forms, can be furnished ground with any of the common types of serrations.

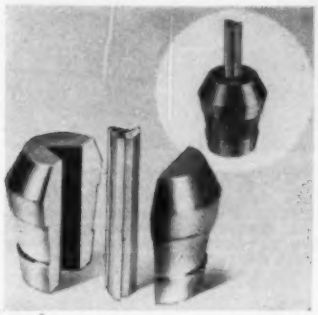


MILLING BLADE — *Viking Tool Co., Shelton, Conn.* This milling-cutter combination combines the stock removal qualities of brazed and serrated blade-tipped cutters with the economical regrinding features of the solid-carbide-bladed face mills.

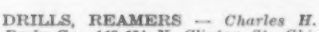


REAMERS—*Wendt-Sonis Co., Hannibal, Missouri.* Line of carbide-tipped adjustable reamers feature replaceable carbide-tipped cutting blades.

CARBIDE DRILLS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* Fast-spiral carbide-drill line is offered in sizes of 3/16 to ½ in. Drills have straight shanks and are designed for deep-hole drilling in aluminum, magnesium, and soft plastics.



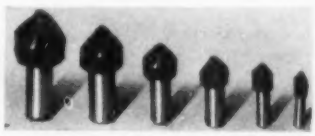
BIT—*Kennametal Inc., Latrobe, Pa.* The Triple-Life Kennamatic router bit has three cutting edges of which only one is operative at a time. When this becomes dull the bit is turned so that another edge comes into cutting position.



DRILLS, REAMERS — *Charles H. Besly Co., 118-124 N. Clinton St., Chicago 6, Ill.* Available in all styles and sizes high-speed twist drills and reamers have been added to the present line of Besly taps, abrasive wheels, grinders, and accessories.

CORE DRILL—*Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Core drill has strips of wear-resistant metal brazed on the entire length of the flutes.

DRILL SET—*Keo Cutter, 19326 Woodward, Detroit 3, Mich.* This drill and countersink set consists of seven popular sizes with OD range from ¼ to 7/16 in.

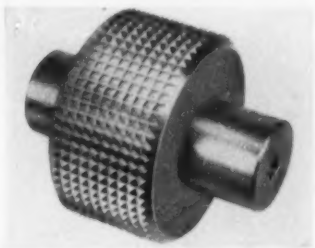


COUNTERSINKS — *Severance Tool Industries, Inc., Saginaw, Mich.* Made of high-speed steel, this line of Severance "Chatter-Free" Econo-Sinks come in six sizes ranging from ¼- to 1-in. OD.

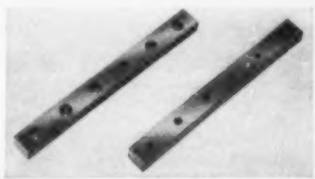
SAW BLADES—*The Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 11, Ohio.* Carbide-tipped and cast-alloy-tipped saw blades have been added to the line of Triple-Chip segmental and solid saw blades. Segmental-tipped blades are made in diameters to 18 in.

COUNTERSINK SET—*Grobet File Co. of America Inc., 421 Canal St., New York 13, N. Y.* Made of high-speed steel, ground after hardening, these three sets come in strong wooden boxes which hold each size separately and range from ¼- to 2-in. dia with 30, 41, 45° angles.

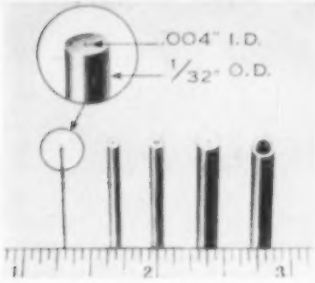
EXTERNAL HONE—*Motch and Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio; representative for Delapena & Son, Ltd., Cheltenham, England.* The Delapena external hone produces precision external diameters quickly and cheaply. It is designed to correct ovality, remove taper, and produce micro-finishes.



KNURLNG WHEEL — *Kennametal Inc., Latrobe, Pa.* Supported on a solid-Kennametal pin, this solid-Kennametal knurling wheel for roughing mill rolls is said to last up to 100 times as long as steel wheels before regrinding is necessary.



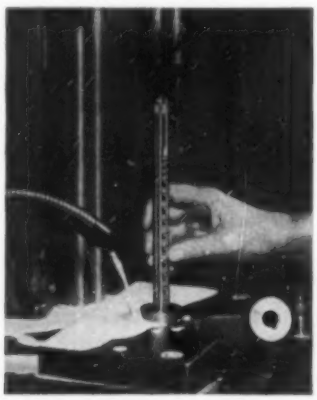
WEAR STRIPS—*Scully-Jones & Co., 1902 S. Rockwell St., Chicago, Ill.* Cast from Ampco Metal Grade 21, these aluminum-bronze wear strips for boring bars and driving tools piloted in bushings are said to minimize sizing and galling caused by high speeds, heavy loads, and adverse operating conditions.



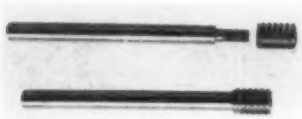
CEMENTED-CARBIDE TUBES — *Kennametal Inc., Latrobe, Pa.* Cemented-carbide tubes as small as 1/32-in. OD with an ID of 0.004 in. and as large as 9/16-in. OD with a wall thickness of 1/16 in. are manufactured by extrusion methods.

BROACH — *The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Interchangeable cutting blades of any width up ⅝ in. can be furnished for the "Jumbo" broaches which are available in 1 9/16-, 1¾-, 1⅞-, 1 15/16-, 2- and 2½-in. dia sizes.

ADAPTERS—*The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* For cutting tapered keyways in straight bores, straight keyways in tapered bores, and tapered keyways in tapered bores, with standard Glenny broaches, Glenny tapered adapters are available in sizes ranging from ½ to 2 in. in increments of 1/32 in.



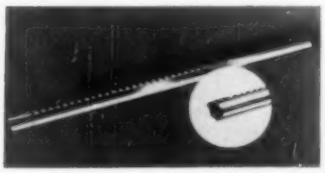
PUSH BROACH—*Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* The LK broach, for production operations, incorporates a special tool design which facilitates single-pass broaching in many different materials.



ROTARY BROACH — *Shearcut Tool Co., Reseda, Calif.* Rotary broaches, in sizes above 1 5/16 in., are detachable from their special holders.

BROACHING KIT—*The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* The Standard SB-50 broach kit consists of a 1-in. dia Glenny broach, four interchangeable cutting blades, five eccentric bushing-type adapters and a sturdy metal carrying case.

BROACH—*Chicago Broach Co., 5514 West Lake St., Chicago 44, Ill.* On the Xpand-O-Lap broach (lap is self-expanding due to constant pressure exerted by S-shaped spring on two sleeves), the wearing surface of the lap extends full length of sleeves.



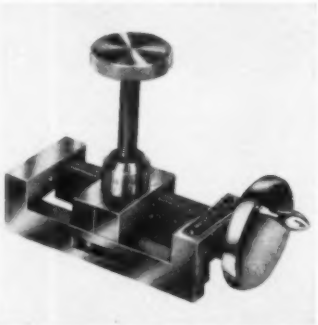
BROACH—*The duMont Corp., Greenfield, Mass.* "Minute Man" production-type keyway push broach can be used with either a hydraulic or hand-operated arbor press for multiple production of keyways in moderate quantities.

BROACH—*The Shearcut Tool Co., Box 746, Reseda, Calif.* The Shearcutter thread-cutting broach generates a threaded hole by true broaching action. Low torque is required.

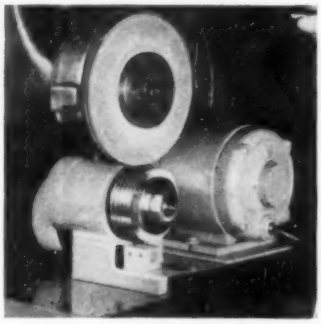
BROACH — *The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* This pencil-size broach will cut 1/16-in.-wide keyways to 0.07 in. deep.

TRUING DEVICE—*Norton Co., New Bond St., Worcester, Mass.* Brake-controlled truing device will accommodate diamond wheels of all bond types with the exception of resinoid-bonded diamond wheels finer than 220 grit.

WHEEL DRESSER—*Matco Tool Co., 2830-36 W. Lake St., Chicago 12, Ill.* The Model B wheel dresser is for surface and external grinders. Capacity is 1⅜-in. width. The vertical travel of the diamond is 1½ in. allowing 3-in. wheel wear.

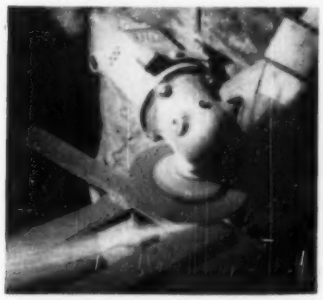


WHEEL DRESSER—*Matco Tool Co., 2834 West Lake St., Chicago 12, Ill.* Model A Wheel Dresser for surface grinders is designed to dress wheels from 1⅜ to 4¼ in. wide. Operator can dress the wheel while grinding.



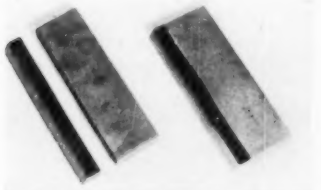
WHEEL-CRUSHER UNIT—*The Jerpbak-Bayless Co., Inc., Chagrin Falls, Ohio.* Portable wheel-crushing unit is for crush forming grinding wheels. The standard unit is for grinding wheels up to 1¼ in. in width.

GRINDING WHEEL—*Simonds Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa.* Fibrex Red Wheels are manufactured from laminated sheets of cotton fiber filled with abrasive grain. Their field of application is between heavy grinding and light sanding.



GRINDING WHEEL—*Abrasive Wheel Dept., Raybestos Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J.* Manhattan Moldiscs are supplied in standard 7-in. dia. ¼-in. thickness with ⅞-in. hole. Speeds up to 6000 rpm are recommended for best efficiency.

BONDED DISK WHEEL—*Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J.* The Moldisk is a bonded disk wheel for rotary sanders. Is said to have the free-cutting qualities necessary in fabricating stainless steel.



GRINDER BLADES—*Diamonds and Tools, Inc., 19345 John R. Street, Detroit 3, Mich.* Silver soldered to present blades, Colmonoy centerless-grinder blade tips are claimed to increase wear life eight times over that of high speed steel.

DIAMOND ACTUATOR—*J. K. Smit & Sons, Detroit, Mich.* Cumbersome practice of rotating diamond tools by hand is eliminated by this automatic diamond actuator. Compression of a plunger against the end guard of a grinding machine rotates diamond automatically 22½° on each complete pass across the wheelface.

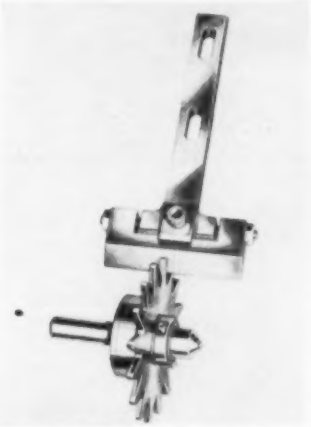
ABRASIVE COMPOUNDS — *United States Products Co., 518 Melwood St., Pittsburgh 13, Pa.* Three different grades of abrasive compounds have been developed specifically for use in grinding and lapping-in brass or bronze tapered plug or key-cock valves.

ABRASIVE COMPOUND—*Industrial Products Div., Elgin National Watch Co., Aurora, Ill.* Diamond abrasive compound resists caking or drying out, is soluble in commercial solvents and water, and leaves no dulling film on finished surfaces.

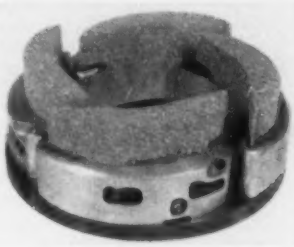
ABRASIVE—*Mansco Grinding Wheel Co., 2165 E. 36th St., Cleveland 15, Ohio.* The Buxite process is a method of coating each grain of a grinding wheel with a microscopically thin shell of carbon in an isotropic vitrescent form.

DIAMOND SETTING—*National Diamond Laboratory, 108 Fulton St., New York 7, N. Y.* Capable of setting both single-stone cluster and multi-stone diamond tools under proper conditions, this equipment can set 400 industrial diamond tools per day.

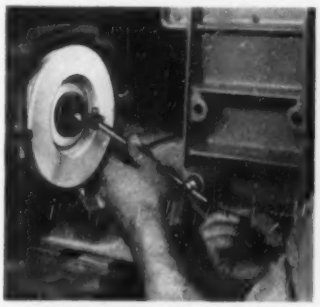
DIAMOND TOOL—*Diamonds and Tools, Inc., Dept. P., 19345 John R., Detroit 3, Mich.* Diamond dressing tool is for both rough and finish dressing or truing on surface, cylindrical, or centerless grinders.



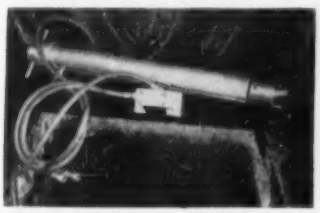
DIAMOND-MISER—*Wheel Truing Tool Co., Detroit, Mich.* Toolholder accessory for production-grinding machine work controls various aspects of the diamond wheel-dressing operation and prevents misuse and diamond wastage.



GRINDING SEGMENTS — *Abrasive Associates, 1216 Industrial Trust Bldg., Providence 3, R. I.* Embodying a sweeping action which clears grit and dirt from the cutting path, the AA segmental grinding chuck unit employs bonded-abrasive segments and holding devices which are interchangeable among a wide diameter range of chuck plates.

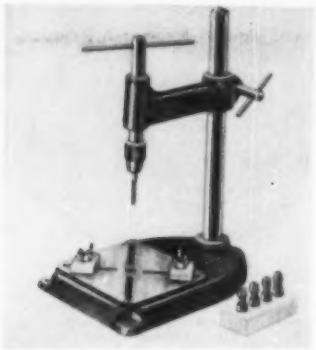


WHEEL DRESSER—*Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.* Contour grinding wheels may be dressed within 0.0005 in. or less with the Diaform wheel-forming attachment. The unit can be mounted on any horizontal surface grinder, either by placing on a magnetic chuck or by clamping to the grinder table.

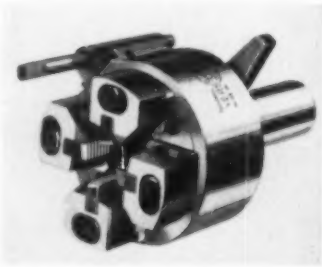


DIAMOND TURNER—*Cleveland Industrial Tool Corp., 1080 E. 222nd St., Cleveland 17, Ohio.* The Model 1001-A Citco hydraulic diamond turner, for Cincinnati centerless grinders, automatically repositions dressing diamonds by turning them three degrees.

WHEEL DRESSER — *Condenser Cleaners Mfg. Co., 1041 McCartney St., Pittsburgh 20, Pa.* Radil, tangent, and angle dresser for grinding wheels has the rotating member supported at both ends, giving the diamond a "between centers" support for accurate, chatterless dressing.



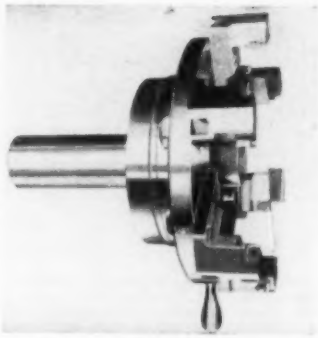
HAND TAPPER—*The H. D. Herder Tool Specialties Co., 2424 Brook Drive, Kalamazoo, Mich.* Of square-socket-and-shank design, Model HT-250 is a bench machine for sensitive, precision, small-hole tapping.



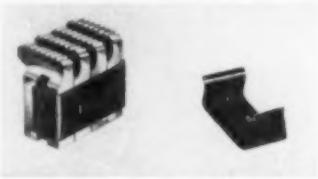
CHASER UNITS—*The National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* Adjustable blade chaser is for limited-production lots of both threading and hollow-milling work.

TAP CHUCK — *Dahlstrom Mfg. Co., Dept. B 2520, Larpenteur Ave., W. St. Paul 8, Minn.* Dahlstrom tap chuck is for occasional power-tapping jobs. It eliminates the center-and-wrench method of tapping on a lathe or drill-press.

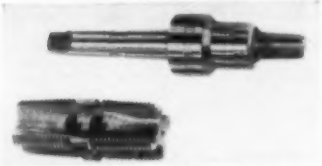
ROTARY DIEHEAD—*The Geometric Tool Co., New Haven 15, Conn.* Style KDS diehead with five chasers and intermittent cutting action, lessens the possibility of poor threads and distortion. This head can be applied to automatic machines, drill presses, and other machines where the diehead rotates.



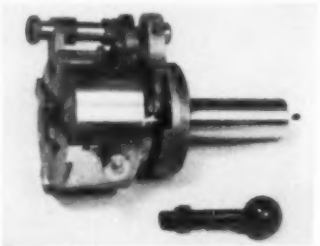
DIEHEAD — *Landis Machine Co., Waynesboro, Pa.* The 40AXX Landmatic diehead threads valve seat rings up to 14¾ in. dia. An internal trip arrangement permits setting the stops on the turret so as to allow the normal pull-off action to trip the diehead.



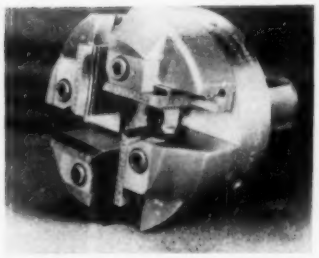
CHASER CLIP—*The Geometric Tool Co., Blake and Valley Streets, New Haven 15, Conn.* The Geometric Chaser Clip is designed to keep Supermetric chasers in order. It is a spring steel clip offered to take the place of the former method of wiring.



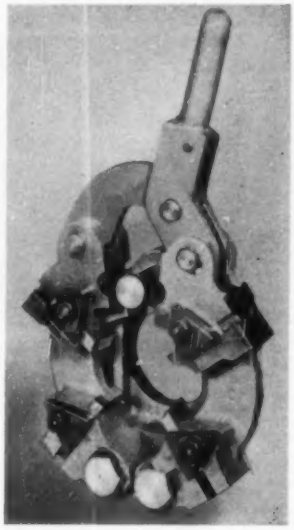
TAPS—*National Precision Tool Co., Arch Street Extension, P. O. Box 523, Carnegie, Pa.* D-line double-end taps are reversible having threads at both ends. The D-line floating tap holder is used in connection with the double-end taps.



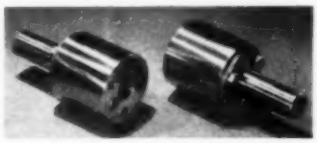
DIEHEAD—*The Geometric Tool Co., New Haven 15, Conn.* Style DS convertible self-opening diehead compensates for misalignment of machine and provides quick centralizing of dieheads with work.



DIEHEADS — *Landis Machine Co., Waynesboro, Pa.* Diehead is for use on automatic machines for threading street ells and similar cast-iron fittings where clearances are limited between diehead and machine.

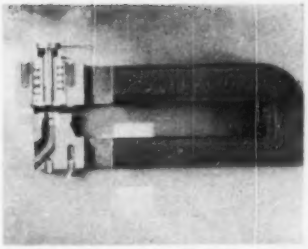


DIEHEAD — *Peerless Machine Co., 1600 Junction Ave., Racine, Wis.* Overall time for threading pipes, bolts, and solid rounds is reduced with a quick-opening die head featuring monotype high-speed steel chasers for long-life cutting service.

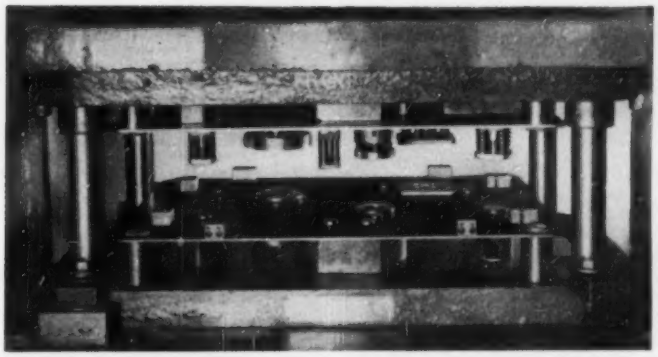


TAP HOLDER — *Marcellus Mfg. Co., Belvidere, Ill.* Tap holder operates to within 0.005 in. The releasing-type holder permits only the working part of tap to be exposed.

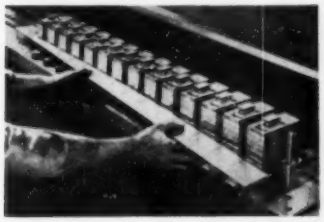
TAP GUIDE—*Dahlstrom Mfg. Co., Dept. B, 2520 Larpenteur Ave., St. Paul, Minn.* Dahlstrom tap guide can be used for hand-tapping and will also fit into the tailstock of an ordinary lathe. The spindle pulls out for lathe use, or as a tap extension for hard-to-get-at places.



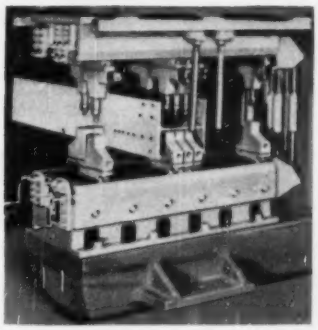
NOTCHING SYSTEM—*Wales-Strippit Corp., North Tonawanda, N. Y.* Wales self-contained units for perforating and notching sheet metal eliminates expensive single-purpose dies. The system operates on both stamping presses and press brakes.



DIE SET—*S. B. Whistler & Sons, Inc., Buffalo, N. Y.* Whistler magnetic perforating punches and dies are assembled in templet mounting plates. On completion of any job the punches and dies, with their retainers, are removed and ready for use in the new arrangement.

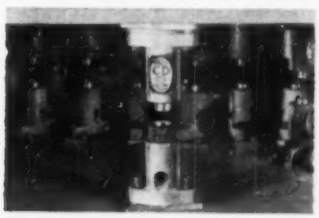


NOTCHING UNIT — *Wales-Strippit Corp., North Tonawanda, N. Y.* These louver-notching units are used in long slits in fluorescent-fixture louvers. Self-contained design permits reuse of unit in unlimited setups in press brakes and stamping presses.



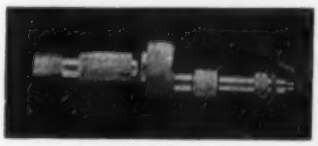
PUNCH TOOL—*The Beatty Machine & Mfg. Co., Hammond, Ind.* Fitting any Beatty toggle-beam punch, this adjustable set of punch tools is for punching webs of beams and channels and punching legs of angles and plates.

SPEED REDUCER — *McLaughlin & Co., 909 E. 59th St., Los Angeles 1, Calif.* Any ¼-in. electric or air drill can be converted into a multi-purpose tool for heavy-duty boring, drilling, reaming, screw driving, or nut running, by attaching the Grip Torc speed-reduction unit to the drill chuck or spindle.

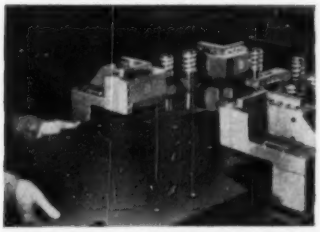


HOLE-PUNCHING UNITS — *Wales-Strippit Corp., North Tonawanda, N. Y.* Type CD hole-punching unit is an adapter set-up method eliminating the necessity of large ground-steel plates and accurate hole-drilling equipment.

DIES—*The Crescent Tool and Die Co., 1714 Southfield Blvd., Lincoln Park 25, Mich.* Crescent carbide dies for manufacturers of electrical parts and precision stampings are made to customer's specifications, or designed from part prints if desired.



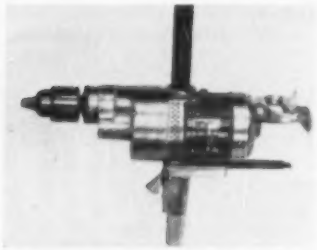
STEP-UP HANDPIECE — *Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill.* The Wyco 1300 step-up handpiece can be used with any Wyco flexible-shaft machine, except the Junior and Wycoflex models.



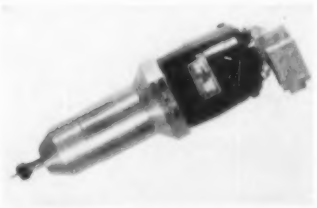
NOTCHING UNITS — *Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y.* A heavy-duty type NJ notching unit provides a maximum 5x4-in. 90° corner notch in metal up to ¼-in. mild steel.

HOLE-PUNCHING UNITS — *Wales-Strippit Corp., North Tonawanda, N. Y.* Wales Type BL hole-punching units are independent and self-contained. The punches and dies are automatically aligned by the holders.

HACK SAW — *Zina Goodell Corp., Salem, Mass.* Operated by any standard electric drill this power hack saw weighs only 21 lb and is suited for 10-in. standard hack-saw blades. It will cut pipe or metal up to 2-in. dia.

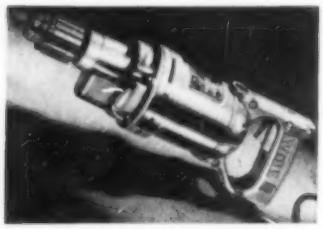


ELECTRIC DRILL—*Louisville Electric Mfg. Co., Louisville, Ky.* The Pioneer drill can be shifted from high (680 rpm) to neutral to low (460 rpm), while the motor is operating. This unit can drill ¼- to ⅝-in. steel.



DRILL UNIT — *Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Redesigned automatic drilling unit includes a constant bath of oil for all moving parts. It is designed to drill holes ranging from No. 50 to ¼-in. dia in metals and plastics.

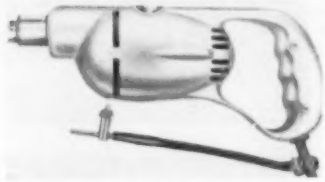
DRILL AND POWER HAMMER—*Hamer-Dril, Box 158, Planetarium Station, New York 24, N. Y.* The Hamer-Dril is an adapter which when chucked in any ¼-in. electric drill converts it into a compact, portable power hammer.



ELECTRIC DRILL—*Fred L. Stuart, Room 1111, 33 West 42nd St., New York 18, N. Y.* Heavy-duty portable electric drill serves as a drillpress and as a bench grinder. Steel drilling capacity is ⅝ in.

ROTARY DRILL—*Master Pneumatic Tool Co. Inc., Orwell, Ohio.* Midget-size rotary drill of ¼-in. capacity, the Master Power M-900, is available in speeds of 1200, 2400, and 4800 rpm for drilling up to and including ¼-in. holes in all materials.

ELECTRIC DRILL—*Stanley Electric Tools, New Britain, Conn.* No. 24A ¼-in. electric drill can be used at full load for continuous drilling without stalling. Speed is 1800 rpm for no load and 1100 rpm for full load.



PORTABLE DRILL—*Cummins Portable Tools, 4740 N. Ravenswood Ave., Chicago 40, Ill.* Operating on 115 volts ac or dc, streamlined ¼-in. general utility drills are housed in die-cast aluminum and weigh 3 lb.

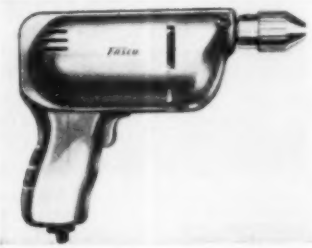
PORTABLE DRILLING — *Pressure Handle Co., North State St., Wilkes-Barre, Pa.* Attached to standard portable electric or pneumatic drills, chain pressure handle enables operator to control drilling pressures by simply turning the handle.

POWER SAW AND FILE—*Producers and Distributors, Inc., 4015 MacArthur Blvd., Oakland 19, Calif.* Key-hak portable power saw and file will do any of the work of the keyhole saw and the backsaw. Tool can be attached to electric or air drill or motor-driven flexible shaft.

TOOL ATTACHMENT — *Wyzenbeek & Staff, Inc., 838 West Hubbard St., Chicago 22, Ill.* Speed of all Wyco grinders can be stepped up three times or more with the No. 1300 step-up handpiece.

HONING HEAD — *Sunnen Products Co., 7910 Manchester, St. Louis 17, Mo.* The Honall portable honing tool, for sizing and finishing holes, is recommended for generating straight round holes with accuracy to one tenth with surface finish as fine as 2 microinches R.M.S. in hardened steel.

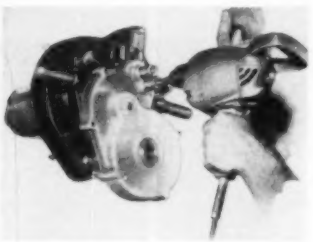
PNEUMATIC GRINDER—*Keller Tool Co., Grand Haven, Mich.* Wheels of ½-in. dia and smaller can be accommodated on the Keller 30-A-7 15-oz pneumatic grinder. With a speed of 75,000 rpm the unit is ideal for touching up dies.



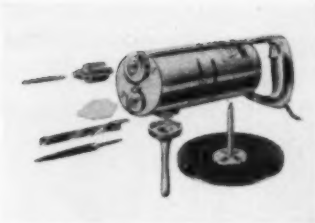
ELECTRIC DRILL—*Fasco Industries, Inc., Rochester, N. Y.* Operating on 110-120 volts, ac or dc, Fasco portable electric unit drills up to ¼-in. steel and ½-in. wood. It has 1600 rpm no-load speed.

GRINDER—*Metal Removal Co., 1014 N. Ashland Ave., Chicago 22, Ill.* Operating on 110-130 ac-dc current at 38,000 rpm, the Roto-Master Hi-speed grinder is equipped with a simple wrenchless collet-type chuck. Collets are interchangeable for 3/32 and ⅛ in.

EDGE GRINDER—*Cleco Div., Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas.* The Cleco 1480 edge grinder is for use on ferrous and nonferrous metals, and is said to be particularly well adapted for work on stainless steel, bronze, brass, and aluminum.



PIPE THREADER — *Muncie Gear Works, Inc., Muncie, Ind.* Capable of threading up to 8-in. pipe in any position, the Porta-Drive portable pipe threader is a 20 to 1 gear-reduction unit driven by any ½-hp heavy-duty electric drill.



PORTABLE ELECTRIC TOOL — *Smilan Tool Co., 2848 West Pico Blvd., Los Angeles, Calif.* Single, portable tool accomplishes drilling, sawing, filing, sanding, polishing, buffing, and other specialized applications. Three separate spindles project from motor housing. Each spindle is used for a different type of work.

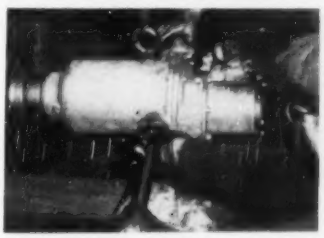
ELECTRIC TOOL—*Sheldon Products Co., 3301 Broadway Ave., Cleveland, Ohio.* Sawing, drilling, filing, honing, sanding, embossing, burring, and grinding are some of the uses for this Sheldon Products Co. all-purpose electric tool. It has both rotary and reciprocating action controlled by a single selector.

ROTARY TOOLS — *Stow Mfg. Co., Binghamton, N. Y.* Jiffy power units employing 5-ft flexible shafts are for polishing, routing, brushing, grinding, buffing, drilling, filing, and sanding.

NOZZLE—*Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, Ill.* A nozzle which delivers a conical, pinpoint blast for blowing chips and dirt from deep cavities and slots has been developed for the Paasche air guns.

PIN RIVETER — *Keller Tool Co., Grand Haven, Mich.* Pin riveter drives both soft-metal-tubular and standard rivets. It is 6 in. in length, weighs 13 oz, its piston diameter is 19/32 in., stroke is ½ in., and the tool speed is 9000 blows per min.

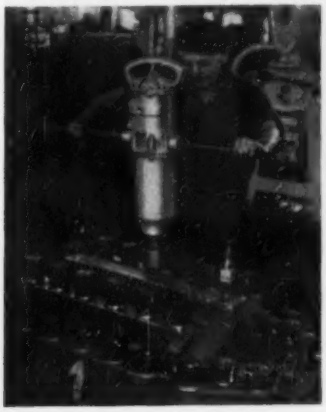
IMPACT WRENCH—*Cleco Div., Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas.* Diametrically located impact anvils on the Cleco A-3 reversible pneumatic rotary impact wrench strike simultaneously, applying balanced power to the socket. Capacity is ⅝-in. bolt size.



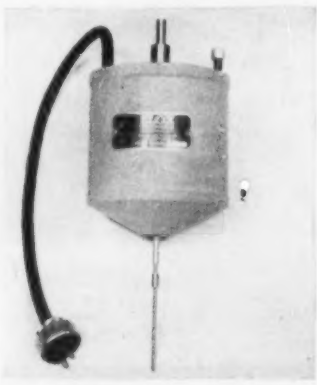
IMPACT TOOL — *Ingersoll-Rand Co., 11 Broadway, New York, N. Y.* The Slugger Size 588 impact tool is designed for speedy repair of heavy equipment and for the manufacture of all types of machinery involving large studs, bolts, and nuts.

CHIPPING HAMMER — *The Roto Tool Co., 17325 Euclid Ave., Cleveland 12, Ohio.* Handles, valves, valve blocks, throttle parts, and locking rings are all interchangeable with all barrels among the 15 models of the "Multi Power" chipping-hammer line.

CHIPPING TOOL—*Atlas Welding Accessories Co., 707 East Lewiston, Detroit 20, Mich.* The Re-Bit weld-chipping hammer permits replacement of worn bits. No balls, springs, screws, or clamps are used.



AIR IMPACT WRENCH—*Ingersoll-Rand Co., Phillipsburg, N. J.* Large-capacity air impact wrench reduces time required for repairing heavy equipment. The wrench is designed to handle large studs, bolts, nuts, and capscrews from 1¼- to 2-in. thread size.



DISINTEGRATOR—*Elox Corp., Clawson, Mich.* Model "X" broken tool, stud and pin remover, can be set into the chuck of a drillpress. The portable disintegrator is listed at $95.

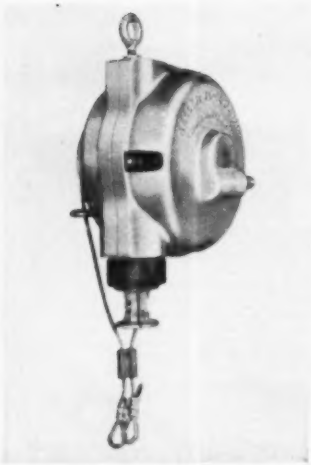
CUTTING SOLUTION — *Elox Corp., 740 N. Rochester Road, Clawson, Mich.* For use with metal disintegrators, this solution is said to speed up broken-part removal and hole cutting from 200 to 500%.

METAL DISINTEGRATOR — *Clinton Machine Co., Clinton, Mich.* Nine times greater cutting speed is claimed with the Thomas Metal Master now in production. The 1950 Model removes ⅝-in.-⅝-in. long broken taps in 60 sec, and cuts a 0.155 hole through ¼-in.

METALLIZING PROCESS — *Bedford Gear and Machine Products, Inc., 200 Harrison St., Bedford, Ohio.* Precision metallizing process is suitable for building a hard, wear-resisting surface on almost any metal part.

SANDERS—*Bradford Machine Tool Co., Cincinnati, Ohio.* Vertical-spindle construction is employed in two portable electric disk sanders. The 7-in. heavy-duty and 9-in. standard-duty sanders weigh 10 and 11 lb respectively.

STUD DRIVER—*The Industrial Engineering Co., 730 E. Sample St., South Bend 18, Ind.* Either right- or left-hand studs up to ½ in.-13 threads can be driven by this torque-indicating stud driver. The unit operates from any drillpress air motor or electric drill.

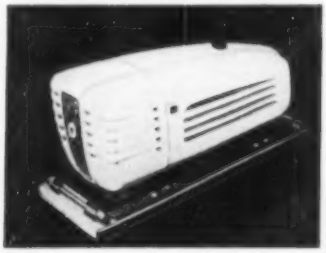


TOOL BALANCER—*Keller Tool Co., Grand Haven, Mich.* Developed to supplement the 10-lb capacity balancer put out by the same company, this unit suspends tools weighing up to 20 lb over the work area.

SANDER — *Aro Equipment Corp., Bryan, Ohio.* Good performance at adjustable speeds is provided in lightweight vertical sander. Speeds up to 5000 rpm can be adjusted by throttle control.

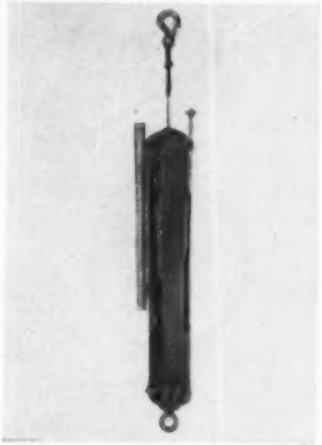
SCREWDRIVER — *Cleco Div., Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas.* Designed to speed production jobs that require driving many small screws and other fasteners, pneumatic reversible screwdriver is scarcely larger than a fountain pen.

TOOL BALANCER—*Keller Tool Co., Grand Haven, Mich.* Portable tool balancer will suspend tools weighing up to 10 lb near the working area. The balancer is adjustable for all tool types and has a working range of 6 ft.



PORTABLE SANDER—*Sterling Tool Products Co., 1540 N. Milwaukee Ave., Chicago 22, Ill.* The Century low-cost portable electric sander weighs 4¾ lb and features a non-stalling, high-speed motor encased in a die-cast aluminum-alloy housing.

SCREWDRIVER — *Cleco Div., Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas.* Built to drive No. 8 machine screws or equivalent, the Cleco A-1 reversible pneumatic screwdriver is 5 7/16 in. long and is said to be free from torque reaction.

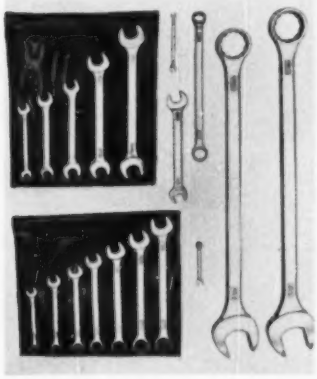


TOOL BALANCER — *The Platz Co., 20433 Sherwood Ave., Detroit 12, Mich.* Tools left in any position in the balancing range are accurately balanced by this production tool balancer. Instrument eliminates any up or down creep, and can be moved with the slightest pressure.

PORTABLE ELECTRIC SAWS—*Independent Pneumatic Tool Co., 175 North State St., Aurora, Ill.* Thor "Silver Line" portable electric saws, features long-shaft transverse motor mounting for extra power and longer tool life.

BALANCE REEL—*Aero-Motive Mfg. Co., 1803 Alcott St., Kalamazoo 24, Mich.* Twenty-lb balance reel is self-winding and suspends portable tools for use on the production line, raising them out of the way when they are not needed.

SOCKET WRENCHES—*Plomb Tool Co., Los Angeles 54, Calif.* Twelve Proto sockets provide greater utility of socket sets.

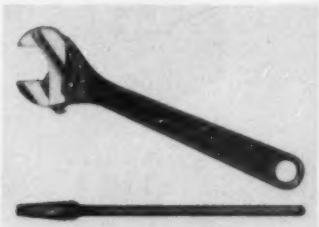


WRENCHES — *Plomb Tool Co., Los Angeles 54, Calif.* Two new sets and six end wrenches add to the versatility of the Proto Wrench Line.

RATCHET WRENCH—*Greene, Tweed & Co., North Wales, Pa.* Heavy-duty wrench, the Favorite Deluxe, is so constructed that when strain or load is applied to the wrench all working parts are in compression.

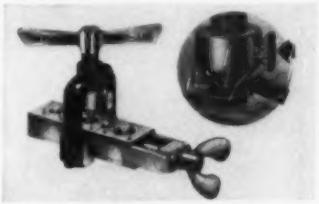
TENSION WRENCH—*Sunnen Products Co., St. Louis, Mo.* Tension wrench has a high limit of 100 ft-lb which can be increased to 150 ft-lb by using a special extension. Wrench is calibrated in both ft-lb and cm-kg.

HAMMER—*Tahlen Metal Industries Ltd. 683 East Hastings St., Vancouver, B. C., Canada. Distributed by H. F. Soderling Co., Seattle, Wash.* No-Bounce hammer is said not to rebound from solid or flexible work. It has a head loaded with angular steel grit. The hammer absorbs the rebound, giving a dead-weight blow.

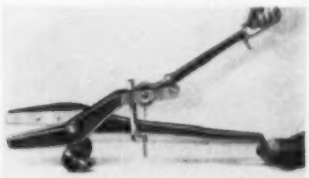


ADJUSTABLE WRENCHES — *J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* Carbon-steel adjustable wrenches have thin tapered jaws. They are made in 4-, 6-, 8-, 10-, 15-, and 18-in. sizes.

PLIERS — *Utica Drop Forge & Tool Corp., Utica 4, N. Y.* Utica Tool No. 550 is a pistol-grip slip-joint combination plier, designed to reach hard-to-get-at jobs.

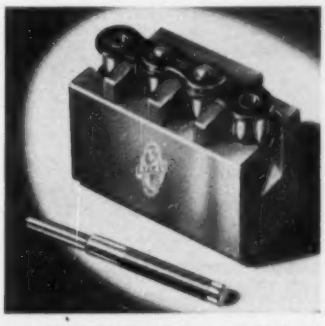


FLARING TOOL — *The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.* The Rol-Air flaring tool both flares and burnishes copper, brass and aluminum tubing to make up tighter flared-tube joints. Three rollers are built in the spreader cone.

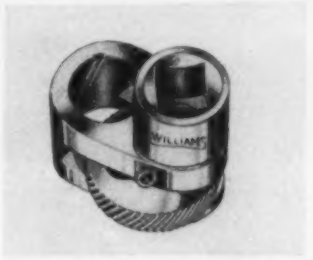


SHEARS—*Super Mfg. Corp., Dept. 28, Chicago 24, Ill.* Heavy-duty Super-Shears cut steel sheets, rods, and bar stock up to ⅛-in. thickness and thicker sections of non-ferrous metals.

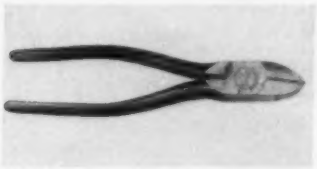
SOCKET-SCREW WRENCHES—*Eklind Tool & Mfg. Co., 2627 North Western Ave., Chicago 47, Ill.* Hex-Uni-Key is six socket-screw wrenches in one. It consists of six sizes of setscrew wrenches anchored in a cast holder.



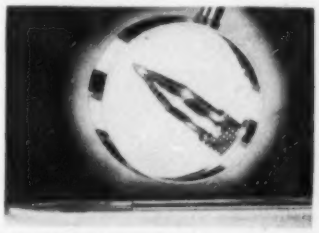
CHAIN REPAIR SET—*Atlas Chain & Mfg. Co., Castor and Kensington Ave., Philadelphia 24, Pa.* This chain tool facilitates chain repair and prevents binding. It consists of an anvil, a fork, and a punch.



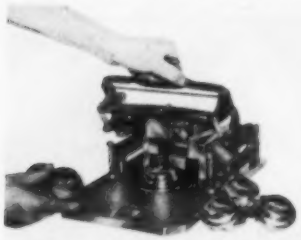
STUD REMOVER—*J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* No. S-60B stud remover, used with ½-in. square-drive handles and attachments is equally efficient for removing or setting studs.



PLIERS—*J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* Diagonal-cutting pliers in 6- and 7-in. sizes are drop forged from a special high-carbon steel.



SCRIBER—*Niagara Instrument Corp., 58 Market St., Lockport, N. Y.* With vertical and horizontal knurls providing a grip on the 5-in. shank, the Niagara tungsten-carbide scriber cleanly marks toolbits, hardened steel, chromium, stone, and glass.



COLOR FILLING MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* This color-filling machine applies color enamel filling into sunken lettering and design. Design may be flat, curved, concaved, or convexed.

MARKING MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Assembly for foot or arbor press gives high-production marking of cylindrical parts by using a V-block as a nest or stamping-block assembly.

MARKING MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* This unit rolls data into nameplates at a rate of from 25 to 30 large plates per min.

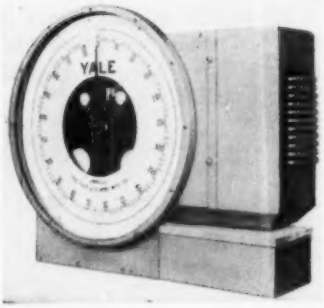
CYLINDER MARKER—*The Acromark Co., 7-13 Morrell Street, Elizabeth 4, N. J.* Extension cradle rolls offer a telescoping principle permitting quick adjustment for varied lengths of cylindrical parts. Fuses, tubes, bushings, rods, shafts, mandrels, and other parts can be marked in the Model 9A marking machine.

MARKER—*Western Lithograph Co., 289 Rose St., Los Angeles 54, Calif.* Identification of terminals, harness boards, switches, and panels is said to be improved with Spot-It, a self-adhesive marker applied to any wire end or terminal.

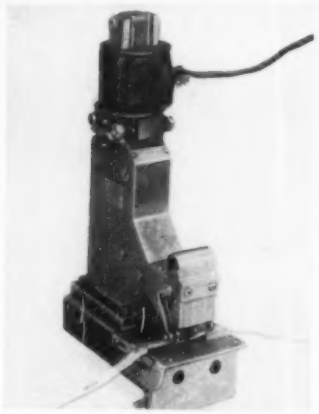
REVERSE STAMPS—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh, Pa.* Reverse safety stamps for reproducing raised letters and figures on plastic, glass, or rubber products are made with 30° bevel characters. Character sizes range from 1/32 in. through ½ in.

MARKER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh, Pa.* Fitted with floating springs for retaining stamps, the Cunningham "Luminum-Line" periphery marker stamps outer circumferences of pipe tubing, axles, large shafts, and other rounded products.

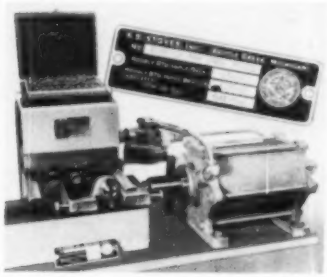
MARKING MACHINE—*Noble & Westbrook Mfg. Co., East Hartford, Conn.* The No. 292 Roll-O-Matic marking machine will mark inscriptions permanently into both flat and round pieces at production speeds of approximately 3000 to 4000 pieces per hr, depending upon the size and style of the work to be marked.



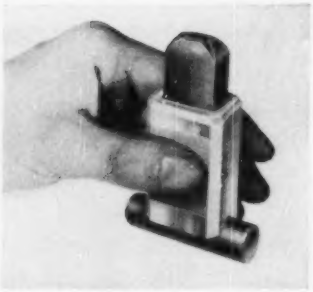
WEIGHT PRINTER—*Yale and Towne Mfg. Co., Philadelphia, Pa.* Scale weight printer prints actual scale weights and identification numerals 9/32 in. high without additional printing or mental calculation.



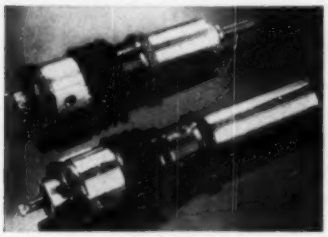
NUMBERING MACHINE—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* The Acromark solenoid numbering machine applies an inked consecutive number at each actuation of the solenoid without interfering with the continual movement of the tape or strip being marked.



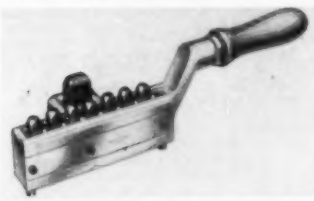
MARKING MACHINE—*Jas. H. Matthews & Co., 3956 Forbes St., Pittsburgh 13, Pa.* This Matthews 222 nameplate-marking machine marks nameplates where there are frequent changes in character alignment and nameplate size. Machine is a bench-type pneumatic type.



STAMP HOLDER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 3, Pa.* The Luminum-Line Set-Rite stamp holder for solid-steel hand stamps is cast from rough, lightweight aluminum. Sides are knurled to assure absolute grip.

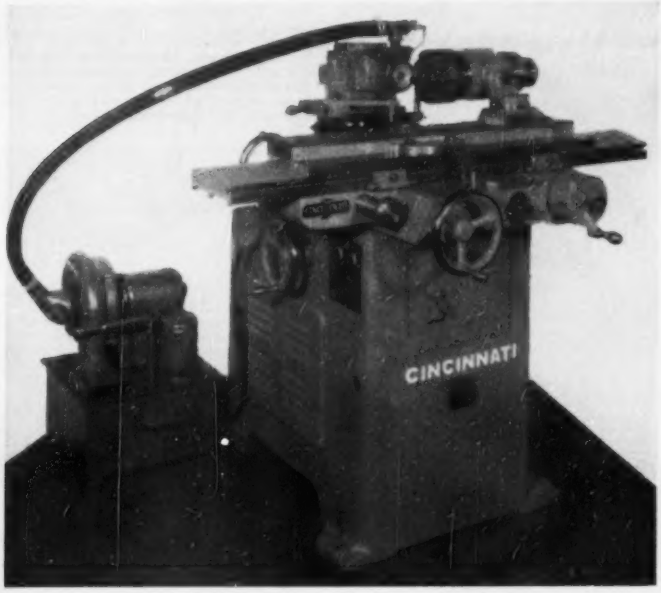


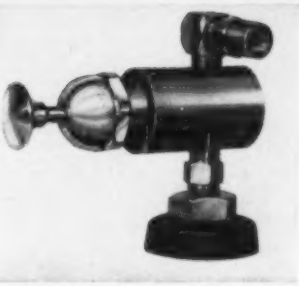
MARKING DEVICE—*Mark-Tex Corp., 453-455 West 17th St., New York 11, N. Y.* Mark-Tex marking device in tube form is said to work effectively on polished, painted, or unpainted surfaces. Marker is supplied in a tube with a pressure bulk point.



MARKING HOLDER—*The M. E. Cunningham Co., 95 East Carson St., Pittsburgh, Pa.* This aluminum plate- and pipe-marking holder weighs 50% less than the former model and is adaptable to heavy-duty marking requirements.

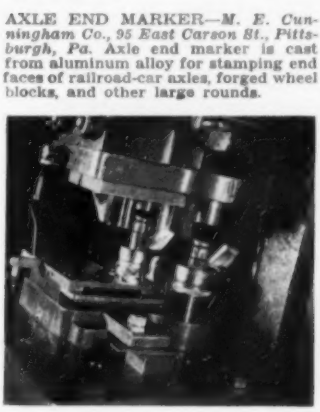
ENGRAVED DIES—*The Acromark Co., 7-13 Morrell St., Elizabeth, 4, N. J.* Coining die (left) is for stamping watch dials, fine-instrument dials, fine-design trade marks, and emblems from stainless steel, gold, silver, brass, or copper.





LUBRICATOR — *Bijur Lubricating Corp., 43-01 Twenty-Second St., Long Island City 1, N. Y.* The LPM lubricator is a small compact sump-mounted unit recommended for closely controlled but infrequent oil-feed operations.

AXLE END MARKER—*M. E. Cunningham Co., 95 East Carson St., Pittsburgh, Pa.* Axle end marker is cast from aluminum alloy for stamping end faces of railroad-car axles, forged wheel blocks, and other large rounds.



COOLANT ATTACHMENT — *Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.* Mist-type coolant grinding attachment for the Cincinnati No. 2 cutter and tool grinder consists of a coolant-tank pump, suction fan, and flexible return tube, a small-diameter supply tube to the grinding wheel, and a guard which completely surrounds all but the face of the wheel.

OIL-CIRCULATING HEAD—*U. S. Drill Head Co., Cincinnati 4, Ohio.* Fixed-center oil-circulating head unit has 34-spindle 6-in. square head and has been operated successfully at 10,000 rpm with very little heat.

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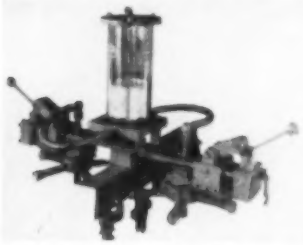
LEADER PIN LUBRICATORS—*Acro Metal Stamping Co., 338 East Reservoir Ave., Milwaukee, Wis.* Requiring no attention other than filling, and specially adaptable for high speed long runs, these oil wells, which slip over the pins, automatically lubricate die-set leader pins.

WICK OILER—*Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.* A variable-feed wick oiler with removable wick retainer has been recommended for any equipment having solid bearings oiled from the top, where a measured quantity of filtered oil is desirable.

OIL CUP—*Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 1½, Wis.* Trico combination oil cups and oil gages replenish oil in bearings, transmissions, and crankshaft cases and facilitate periodical oil-level checking.



LUBRICATOR—*J. N. Fauver Co., 49 W. Hancock, Detroit 1, Mich.* Conveyors requiring no external power for operation can be lubricated by this self-contained grease unit.

FILTRATION CONTROL — *General Filters, Inc., 12890 Westwood, Detroit 23, Mich.* Lower-priced industrial filter for hydraulic and lubricating oils consists of a series of spacers and fine-mesh screens or other filtering media.

DRY LUBRICANT—*The Alpha Corp., Greenwich, Conn.* Specially prepared smooth-textured molybdenum-compound powder, designed particularly for extreme bearing pressure applications, Molykote Type Z, is reported to have exceptional chemical and thermal stability and inertness.

APPLICATOR — *Reardon Products, 2105 South Adams St., Peoria 2, Ill.* Gun-type applicator blows Grafize powder lubricant into working mechanisms. To refill, the nozzle is removed, bulb compressed, and the end inserted into a can of the powder lubricant.

CUTTING OIL—*Oil Products Co. Inc., 4111 So. La Salle St., Chicago 9, Ill.* Excel No. 60 is a high-sulfur ester cutting oil stable under all operating conditions involving the machining of stainless steel, chrome-nickel alloys, and monel.

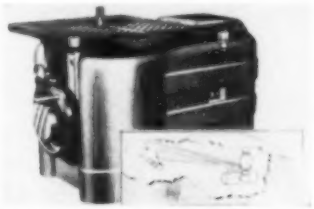
LUBRICANT—*Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.* Lubeway is designed for machine tools that pressure-feed way lubricant from the hydraulic system.

LUBRICANTS — *Rohm & Haas Co., Dept. SP, Washington Square, Philadelphia 5, Pa.* Six chemicals derived from the OXO process offer the possibility of new lubricants for metal cutting.

OVEN CHAIN LUBRICATORS—*The Bel-Ray Co., Inc., Green Village Rd., Madison, N. J.* The lubricators are used for automatically applying lubricants (graphited) to conveyor chains on ovens, furnaces, dryers, and other equipment.

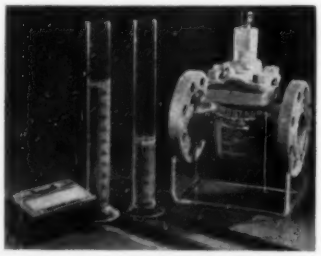
GREASE—*The Texas Co., 135 E. 42nd St., New York, N. Y.* Soft consistency grease for winter use in heavy-duty industrial service is known as H Grease O. It has a lime soap base, is gold in color, and is suitable for low-temperature applications.

LUBRICANT—*G. W. Smith & Sons, Inc., 5400 Kemp Road, Dayton 3, Ohio.* Die Slick No. 9, for pressure die-casting dies, is reported to prevent scoring and sticking and to enable easy ejection of castings from the die. Applied with brush or spray the compound leaves no carbon, gum, or other residue in the die.



OILING — *C. W. Munger, 123 North Sangamon St., Chicago 7, Ill.* Oiling system for Boyar-Schultz No. 1 bench-model profile grinder consists of a reservoir with three distributing lines.

GRAPHITE FILM—*Electrofilm Corp., 7116 Laurel Canyon Blvd., North Hollywood, Calif.* Stable graphite Electrofilm can be applied to metal, plastics, rubber, and ceramics by spray or dip, following normal surface preparation.



LUBRICANT — *Rockwell Mfg. Co., 1500 N. Lexington Ave., Pittsburgh 8, Pa.* Hypermatic grease compound is said to be volumetrically flexible and capable of storing energy for long periods to give automatically to its feeding action.

CUTTING OILS — *The Beacon Rust Proofing Mfg. Co., 20 East 33rd St., New York 16, N. Y.* Water-soluble "501 Oilsaver" cutting oils, mixed 1 part to 400 parts of water, is said to allow 50% reduction in oil, with no loss in coolant standards.

STABILITY-TESTED GREASE — *Norma-Hoffmann Bearings Corp., Stamford, Conn.* Norma G-66 stability-tested grease is now available for bearing lubrication. This ball-and-roller bearing grease provides lubrication of a wide temperature range without separation, drying out, or hardening.

HEAT-TRANSFER FLUIDS—*Carbide and Carbon Chemical Corp., 30 E. 42nd St., New York 17, N. Y.* Made from Polyalkylene glycols and derivatives UCON heat-transfer fluids are reported to be most valuable in a temperature range from 60 to 500 F. They are characterized by low pour points and little change in viscosity with temperature.

COOLANT BASE — *Swan-Finch Oil Corp., RCA Building West, New York 20, N. Y.* Safco 770 compound is a water-soluble coolant base with a consistency of liquid paste, said to combine all the essential qualities of a grinding compound and a sulphurized cutting oil.

GREASE—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.* Aluminum-soda base grease offers an exceptionally high melting point. The heavier grease-type lubricant is designated STA-PUT 18H-2.

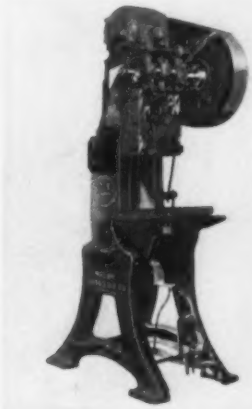
Forming, Forging, Casting

PRESS—*E. W. Bliss Co., Toledo, Ohio.* Straight-side, single- and double-crank presses have frames of four-piece tie-rod construction made of high-grade Meehanite castings. Single-end-drive presses with capacities up to 250 tons have pneumatic friction clutches mounted on the crankshaft.

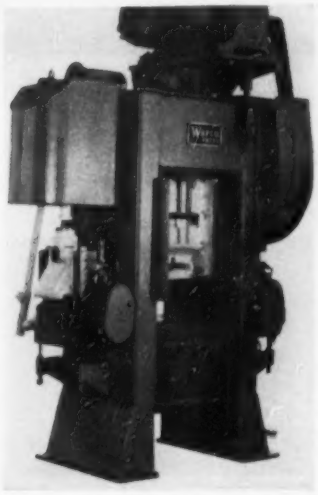
CAM PRESS—*Marshalltown Mfg. Co., Marshalltown, Ia.* Multi-purpose bench-type cam press is for punching, riveting, forming, sizing, upsetting, bending, drawing, staking, and nibbling. Press has a capacity of 1½-ton pressure near bottom of stroke.

→

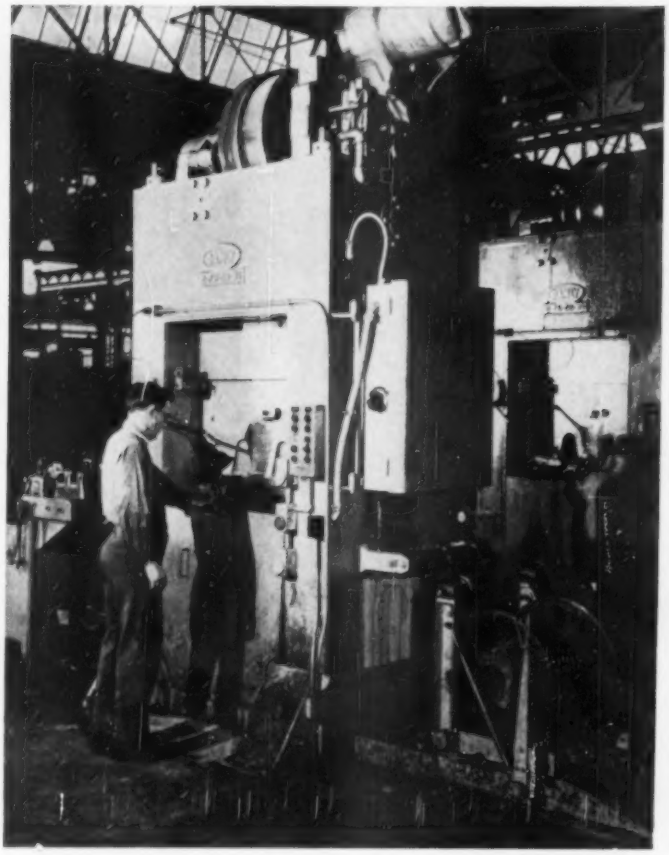
PRESS—*Service Machine Co., 7627-33 South Ashland Ave., Chicago 20, Ill.* Five-ton Rouselle deep-throat press. No. OG, is available in both bench and floor models. The 12-in. throat permits working to the center of 24-in. sheets.



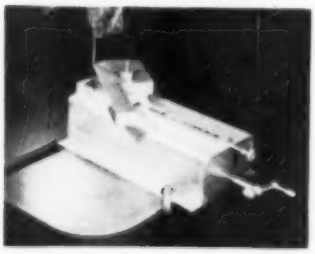
PUNCH PRESS—*The Walsh Press and Die Co., Div. of American Gage and Machine Co., 4709 W. Kinzie St., Chicago 44, Ill.* No. 12X O.B.I. deep-throat flywheel punch press is suitable for die-casting, trimming, and secondary forming operations on sheet metal as well as other punch-press operations.



STAMPING PRESS—*Warco Press Div., Federal Machine and Welder Co., Warren, Ohio.* High-speed stamping is possible with a 75-ton press. Air counterbalancing is provided to reduce the shock of break-through. Infinite variation is possible in feed lengths.

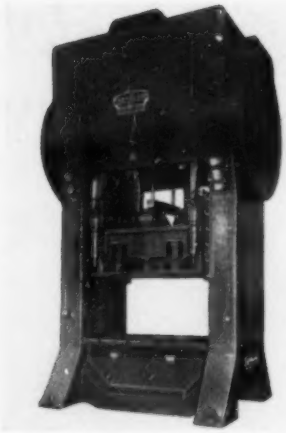


PRESSES—*Danly Machine Specialties, Inc., Chicago, Ill.* Medium- to high-tonnage mechanical presses are designed especially for stamping operations, employing standard progressive or multiple dies. They are available in various sizes and types, having speeds to 250 stroke per min. with capacities from 50 to 800 tons.

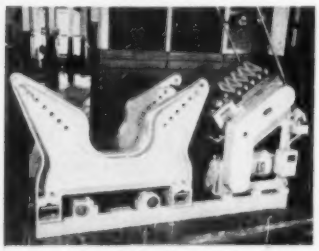


PUNCH PRESS — *Diamond Machine Tool Co., Los Angeles, Calif.* Rated at 30-ton capacity the Diamond Model 3048 punch press combines a 16x18-in. bolster area and a 10x48½-in. ram area that performs a variety of metal-stamping operations including blanking, piercing, notching, bending, shearing, and drawing.

PRESS—*Service Machine Co., 7627-33 S. Ashland Ave., Chicago 20, Ill.* Twenty-five ton Rousselle deep-throat press No. 3-G has an 18-in. throat permitting work to the center of 36-in. sheets. It is equipped with a single-stroke or continuous clutch.

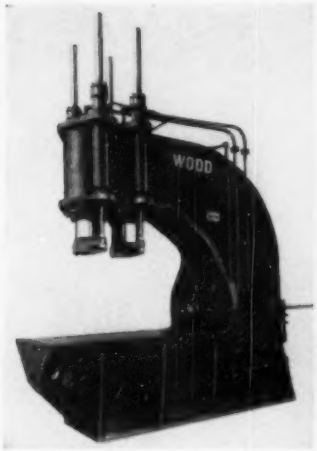


PRESS—*The Cleveland Punch and Shear Works Co., Cleveland 14, Ohio.* Two-point double-action toggle press is double geared, with twin drive and is equipped with electrically controlled air-operated friction clutch. Capacity is 200 tons for the inner slide and 120 tons for the blankholder.

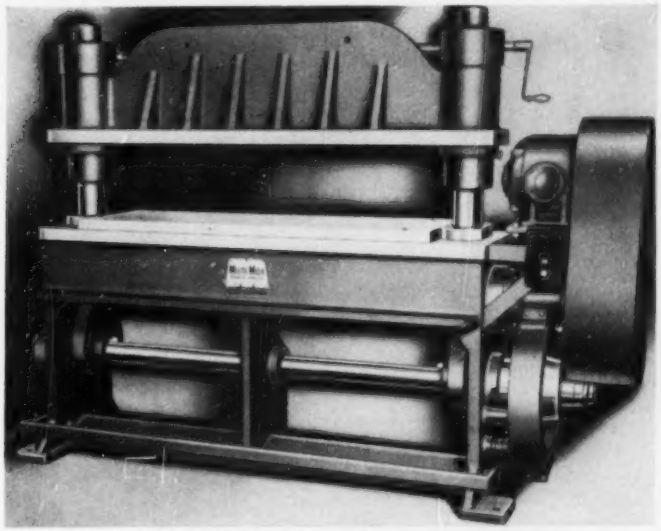


COIL CRADLE—*U. S. Tool Co., Inc., Ampere, N. J.* The Model PDSC-1240 U. S. automatic power-driven coil cradle and stock straightener handles materials up to 12 in. in width, ¼ in. thickness, and coils up to a maximum OD of 40 in.

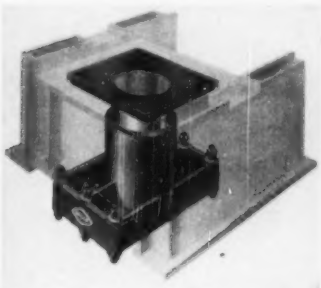
PUNCH PRESS — *Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles, Calif.* Performing all conventional operations such as punching, shearing, staking, riveting, forming, and coining, the Benchmaster Midget has a capacity of "one ton plus" under continuous heavy-duty operations.



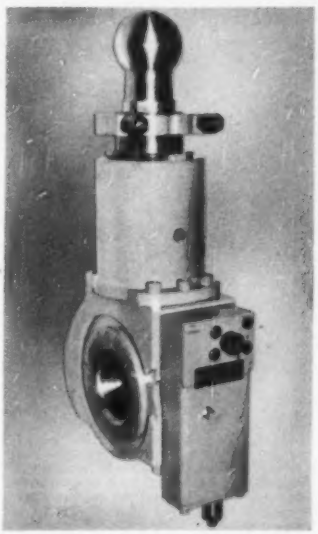
FLANGING PRESS—*R. D. Wood Co., c/o Harris D. McKinney Organization, 12 S. 12th St., Philadelphia 7, Pa.* Designed for sectional flanging operations, this press can also do joggling and upsetting work. It has a 200-ton capacity.



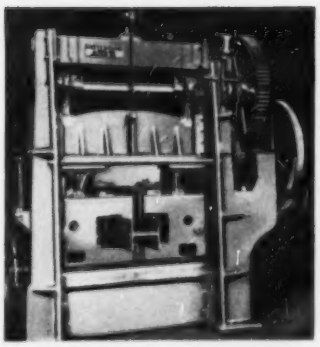
PUNCH PRESS—*Diamond Machine Tool Co., Los Angeles, Calif.* Diamond Multi-Max Punch Press (Model 3048) has a 30-ton capacity and a bed size (working area) of 15x½x49½ in.



DIE CUSHIONS—*Baker Bros. Inc., 1000 Post St., Toledo, Ohio.* Pneumatic die cushions are offered in standard sizes from 4 through 28 in. dia in the single-piston type and from 10 through 30 in. dia in the double-piston type.

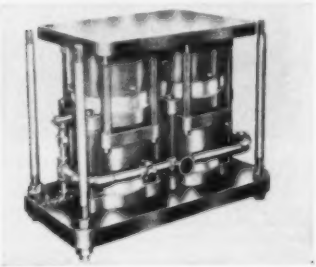


PUNCH PRESS PITMAN — *Dayton Rogers Mfg. Co., 2824 13th Ave., South Minneapolis 7, Minn.* Universal punch press pitman is adaptable to all punch-press cranks for overload protection for press capacities from 25 to 250 ton.

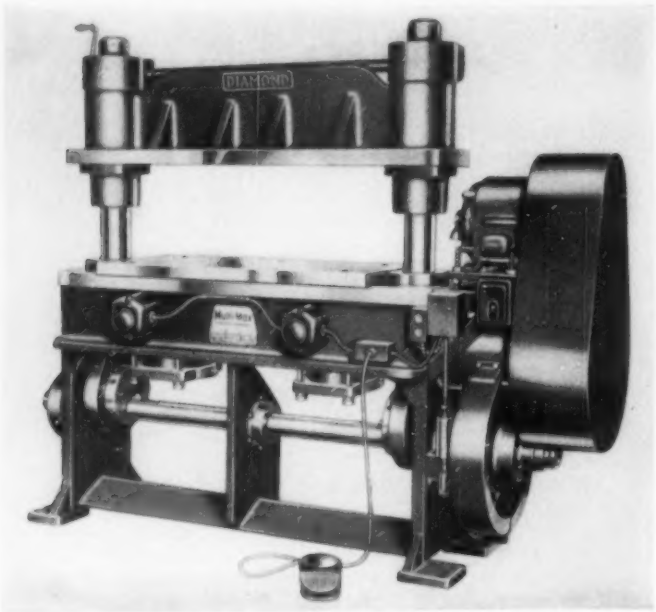


PUNCH TOOLS — *Beatty Machine Mfg. Co., Hammond, Indiana.* Designed for use on the Beatty Guillotine Punch, this adjustable set of flange punch-tools punch all four flanges of I-beams and wide-flange beams in one pass.

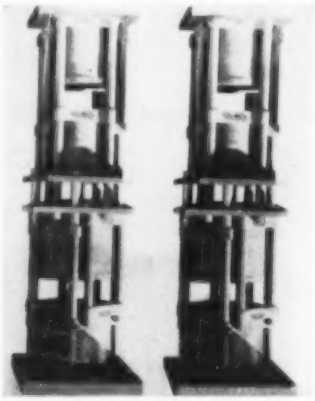
← LOCK-FORMING MACHINE—*Flagler Mfg. Co., Detroit 12, Mich.* Model 20 has four sets of six-stage lock-forming rolls. They form Pittsburgh lock, double seam, flat S cleat, and drive cleat, respectively, in a single pass.



DIE CUSHIONS—*Dayton Rogers Mfg. Co., 2824-13th Ave., South, Minneapolis 7, Minn.* Working off the average shop air line, and provided with convenient pressure-lubrication fittings these pneumatic die cushions are adaptable to large straight-side presses.



PUNCH PRESS — *Diamond Machine Tool Co., 5429 E. Olympic Blvd., Los Angeles 23, Calif.* Model 3936 is a double-crank punch press of 30-ton capacity. Bolster area is 16x36 in. and the ram area is 10x36 in. Standard stroke is 2 in., maximum stroke to order is 4 in.

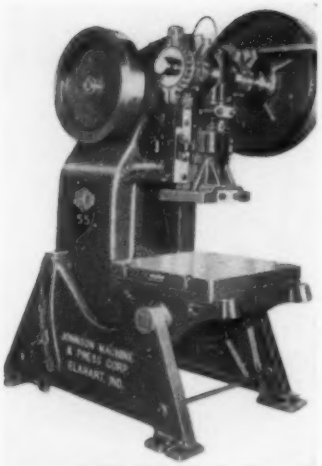


DIE CUSHIONS—*Dayton Rogers Mfg. Co., 2824 13th Ave., South, Minneapolis 7, Minn.* Die cushions of extra-heavy-duty design have an over-all ring-holding capacity of 360 tons, developed by 100-psi shop airline.

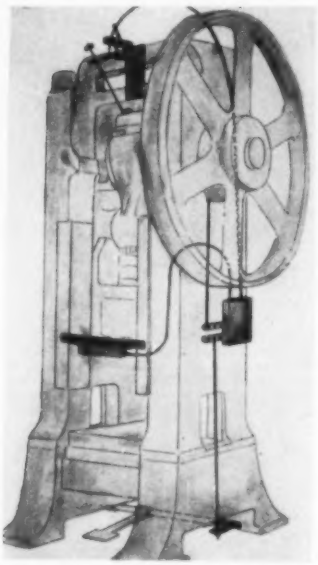
IRON HAND—*Sahlin Engineering Co., 462 South Woodward Ave., Birmingham, Mich.* Designed to accommodate small and medium-size punch presses, the Sahlin junior-size iron hand automatically removes sheet-metal stampings from press beds.

HAND-OPERATED PRESS—*Pioneer Broach Co., 1424 So. Main St., Los Angeles 15, Calif.* Principle of the hand-operated Pioneer Ham-R-Press is transmission of hammer pressure through a vertical ram directly to the working point. Pressures as high as 15 tons are attainable.

NON-REPEAT DEVICE — *Searjeant Metal Products, Inc., Dept. P2, Box 101, Mendon, N. Y.* Adaptable to any press this non-repeat device acts as a secondary clutch. The downward action of the press ram releases it, allowing the upper portion of the treadle rod to disengage the primary clutch on the press flywheel.

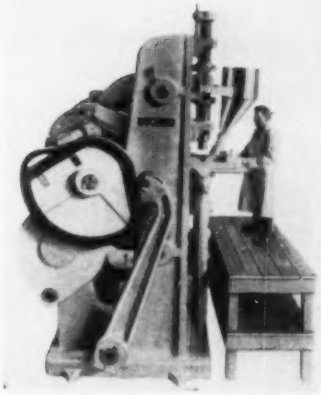


INCLINABLE PRESS—*Johnson Machine & Press Corp., Elkhart, Ind.* Equipped with a 32 x 34-in. bolster plate, Model 55 press handles work up to 16¾ in. deep at 45 pieces per min in vertical or tilted (up to 36°) positions.

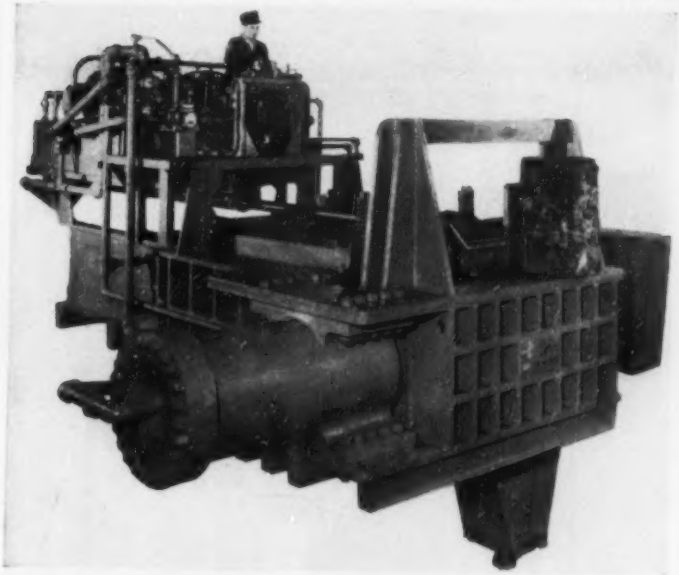


SAFETY GUARD — *Dayton Rogers Mfg. Co., 2824-13th Ave. South, Minneapolis 7, Minn.* The Dayton Rogers two-hand non-repeat punch-press safety guard makes it impossible for the operator to place his hands in the working zone of the press during the working cycle.

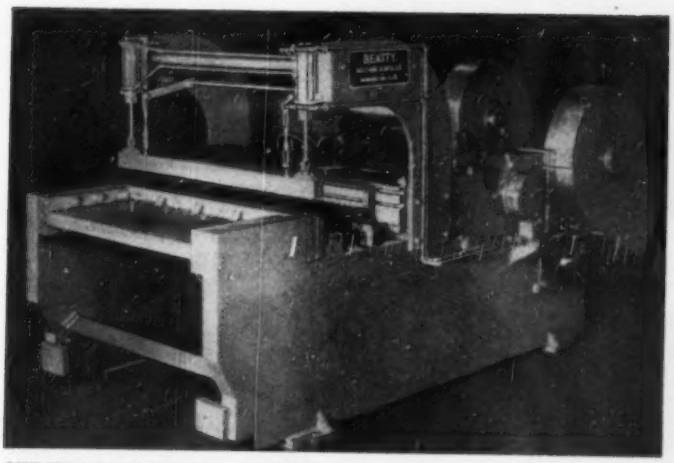
PNEUMATIC DIE CUSHIONS—*Dayton Rogers Mfg. Co., 2824 13th Ave., South Minneapolis 7, Minn.* The 3-in. size Model D-3 pneumatic die cushion is for use on small eletcric-type presses. The hardened and ground pin-pressure pad is custom made to fit the customer's press-bed opening.



POWDER METAL PRESS—*F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa.* The redesigned P-3 cam-type powder metal press is equipped with air cylinders in place of springs for holding rocker arms on both upper and lower cams, shaker cams, and core-rod cams.



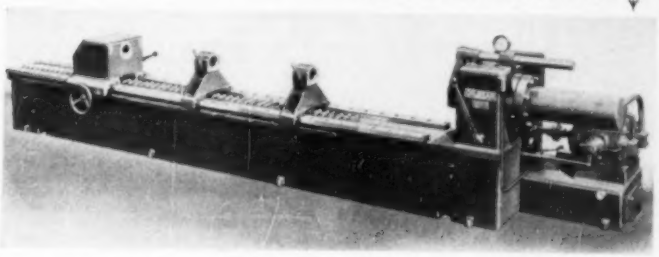
BALING PRESS—*Dempster Brothers, Inc., Knoxville, Tenn.* Scrap-metal baling presses turn out high-density bales of 600 to 750 lb each at the approximate rate of 7.5 tons per hr.



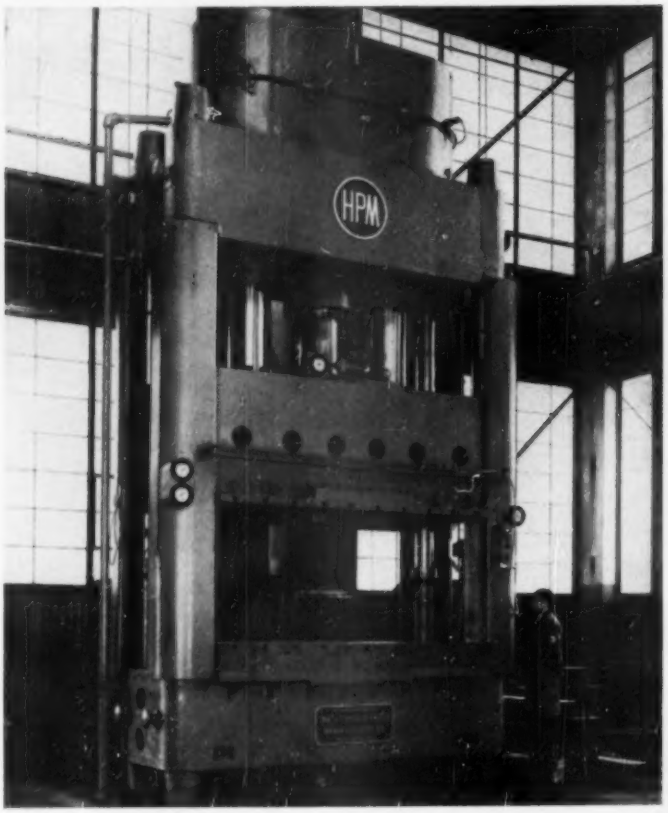
MULTIPLE PUNCH—*Beatty Machine & Mfg. Co., Hammond, Ind.* Horizontal multiple punch with provision for punch tools to be mounted on varying centers across the ram face is designed for multiple punching the flanges of long, wide sheets.

ASSEMBLING PRESS—*The Oilgear Co., 1560 W. Pierce St., Milwaukee 4, Wis.* Horizontal assembling press has an adjustable tailstock capable of resisting full tonnage. The 35-ton press is adaptable for assembling a variety of propeller-stub shafts in tubes.

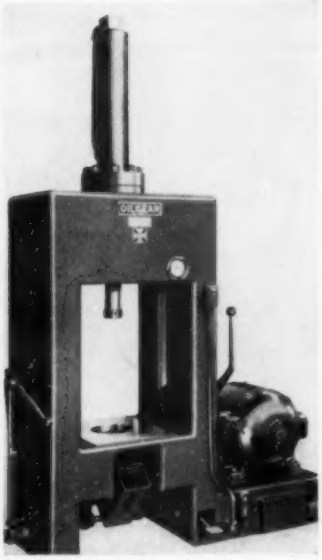
ELECTROPUNCH—*Black & Webster, Inc., 30 Pleasant St., Needham 92, Mass.* A high-speed Electropunch, Model BS 1, incorporates a high-temperature silicone-insulated coil in a solenoid which permits it to operate continuously at more than 150 cycles or blows per min.



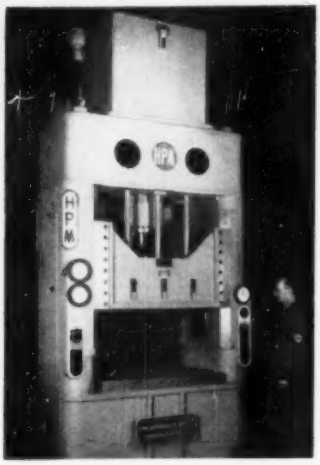
DIE-CUSHION CYLINDER — *Dayton Rogers Mfg. Co., 2824-13th Ave., South, Minneapolis 7, Minn.* Die-cushion cylinder is adaptable for both deep-drawing operations and for pressure-pad control of forming dies.



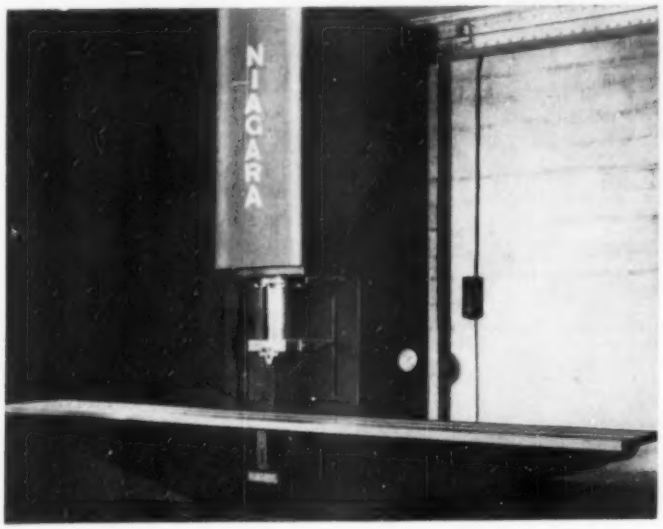
DRAWING PRESS—*The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* The Fastraverse sheet-metal drawing press, with a pressure capacity of 500 or 1000 tons, handles deep-draw jobs of exceptionally large dimensions. It has a platen of 120x72x70-in. daylight opening and 36-in. ram travel.



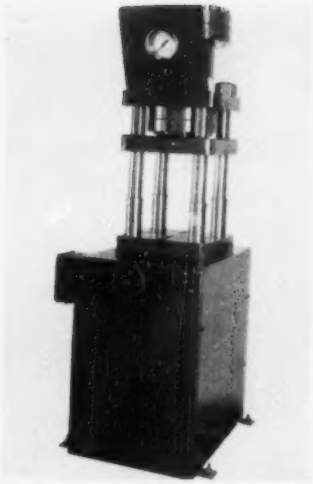
PRESS—*Oilgear Co., 1330 W. Bruce St., Milwaukee 4, Wis.* Two-column vertical press for broaching, swaging, and straightening agricultural implements and tractor parts has maximum tonnage varied from 5 to 25 tons, through a micro-adjustable relief valve.



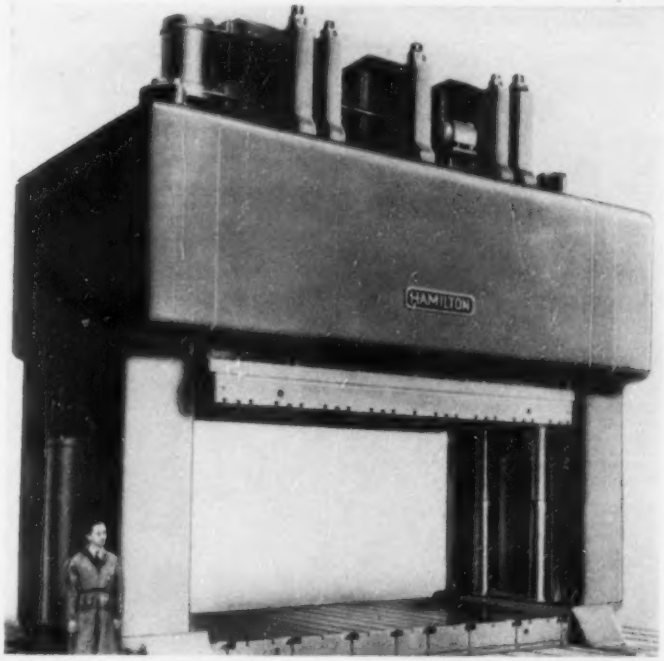
PRESS—*The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* A 100-ton HPM Fastraverse single-action press is an all-hydraulic, self-contained unit. The machine offers a 48x36-in. plate, 30-in. daylight and an 18-in. main-ram travel.



← HYDRAULIC PRESS—*Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo 11, N. Y.* Straightening, forming, broaching, forging, and assembling operations can be handled by a 135-ton hydraulic press with 33-in. ram travel and a 30x240-in. bed.



DRAWING PRESS—*M & N Machine Tool Works, Inc., Allwood, Clifton, N. J.* Engineered for accurate drawing and forming of metals, this 50-ton press has a 10-in. stroke, advanced speed of 120 ipm, and pressing speed under full load of 7½ ipm.



DRAW PRESS — *Lima-Hamilton Corp., Curtis Bldg., Detroit, Mich.* Taking six strokes per min, 600-ton triple-action press for stamping out roofs of automobile bodies can use dies up to 200 in. long and draws 24 in. deep. Rate at which steel sheet flows into the die is about 70 ft per min.

PRESS—*Dake Engine Co., Grand Haven, Mich.* The 50 HE Elec-Draulic Press is equipped with special straightening dies. Distorted castings are placed in the press immediately after their removal from the normalizing furnace.

PRESS — *The Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Two-thousand-ton HPM double-action hydraulic deep-draw press handles deep drawing, forming, and blanking operations on large tractor parts. Equipped with a 500-ton hydraulic blank holder and a 500-ton hydraulic die cushion, it will draw parts up to 16 in. deep.

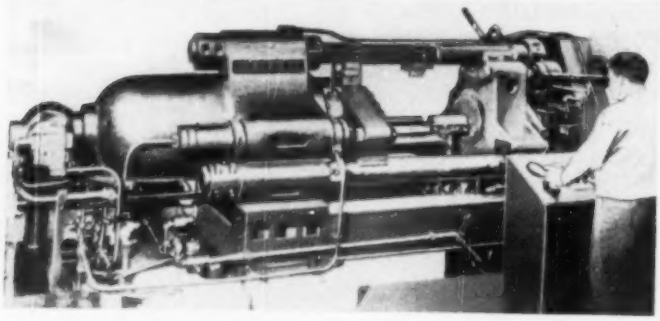
HOBBING PRESS—*R. D. Wood Co., Philadelphia, Pa.* The Wood 1000-ton upmoving Hydro-Lectric press was developed for the accurate hobbing of intricate single- and multi-cavity molds. It provides platen working surface of 24x30 in.

BENCH PRESS—*Munton Mfg. Co., Franklin Park, Ill.* Self-contained motorized hydraulic bench press, type FM, is available in 5-, 13-, 18-, and 20-ton capacities.

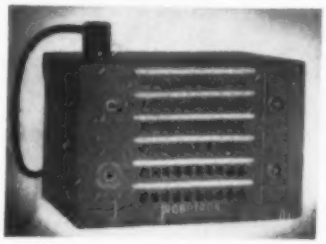
PRESS—*Emmett Machine and Mfg. Inc., 2249—14th St., S. W., Akron 14, Ohio.* The No. E-113 tilting-head hydraulically operated press is available in two sizes having platens of either 14x14 in. or 24x24 in.

PRESSES — *Rogers Hydraulic, Inc., Minneapolis, Minn.* New version of the "60" shop press, in 60- and 80-ton capacities, is for light-duty press requirements. Presses feature a full 13-in. pressure stroke.

AIR PRESSES—*Paragon Metal Products, 844 W. Adams St., Chicago 7, Ill.* Two air presses are for production staking, press-fit assembling, light stamping, marking, and similar successive operations.

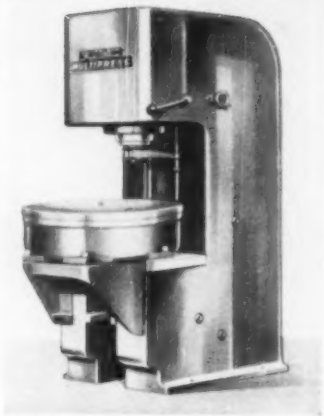


EXTRUSION PRESS—*Hydropress, Inc., 570 Lexington Ave., New York 22, N. Y.* A self-contained oil-hydraulic extrusion press for production of rods and shapes from light metals and other non-ferrous alloys is built in 500- and 1000-ton capacities. A production of 50 to 60 billets per hr can be obtained.



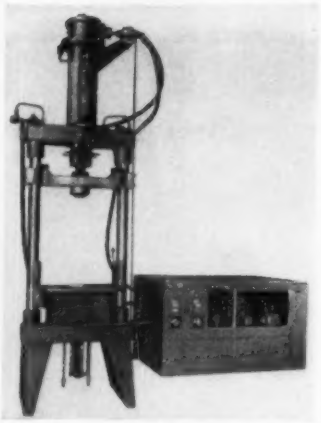
CONTROL UNIT—*Emmet Machine & Mfg. Inc., 2249-I, 14th Street S.W., Akron 14, Ohio.* Model 140-X Robotron control unit performs automatic bumping (breathing) operations on hydraulic presses. The control unit can be set to give from 1 to 40 bumps during any one cycle of operation.

PNEUMATIC PRESSES—*Clayton Mfg. Co., 207 Delaware Ave., Buffalo 2, N. Y.* In Akrite air presses piston is held fixed, and the cylinder serves as the ram. The press is suitable for assembly, staking, swedging and forming, and for some light stamping.



PRESS—*Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* Speed and control advantages are offered in the high-production, 25-ton oil-hydraulic press. The Multi-press has a 15-in. stroke, 25-in. daylight opening and 12-in. throat depth.

HYDRAULIC PRESS—*Dake Engine Co., Grand Haven, Mich.* 125-ton hydraulic press for hand, air, or electric operation, has an 8-inch stroke with an additional 8-inch adjustment. Air models operate from either 90 or 145 psi.



TOOL PRESS—*Hufford Machine Works, Inc., Redondo Beach, Calif.* Rotating-tool hydraulic press is applicable to general pressing and forming operations of plastic materials, where a combination of controlled-tool rotation and pre-regulating pressing tonnage is desired.

HOBBING PRESS—*The M & N Machine Tool Works, Inc., 152 Orono St., Clifton, N. J.* Hydraulic hobbing press has a platen pressure capacity of 1000-ton. Ram stroke is 4½ in., and the opening is 14x17x30 in.

HYDRAULIC WHEEL PRESSES—*Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* With capacities from 50 to 600 tons, self-contained presses are for assembling or removing wheels, pulleys, gears, and similar work. A typical size has a 48-in. clearance between bars, 128-in. maximum daylight, and a 24-in. ram travel.

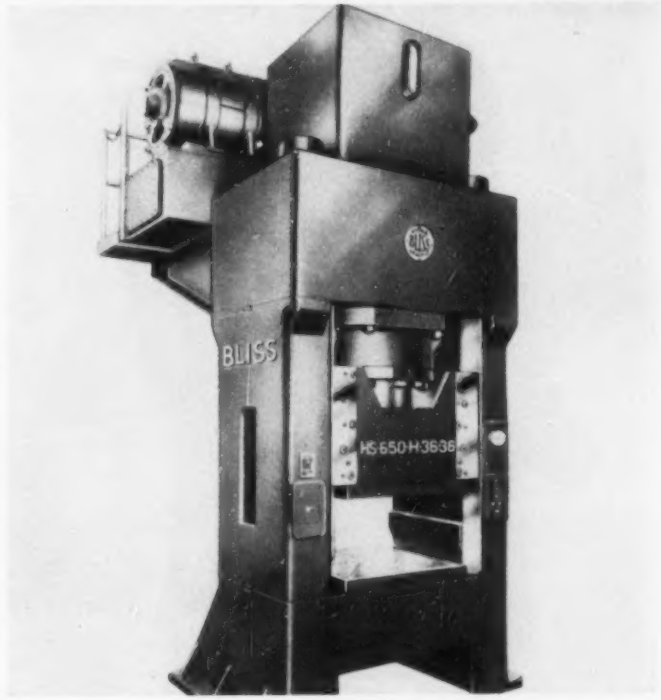
CORNER DRAW PRESS—*The Vulcan Tool Co., 730 Lorain Ave., Dayton, Ohio.* By drawing one corner at a time, hydraulic drawing press eliminates the need for hand welding and metal finishing operations, as well as the need for separate dies for each size panel.

PRESS—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Colonial junior 2-ton 12-in.-stroke hydraulic press is mounted on a specially fabricated inclined base and incorporates a hinged guard screen to cover moving parts during operations. Extra loading convenience and operator safety are the big features.

ARBOR PRESS—*The Bellows Co., Akron, Ohio.* Bellows air-powered arbor press utilizes a specially designed double-acting air cylinder to provide full control of both the advance and retract strokes of the ram.

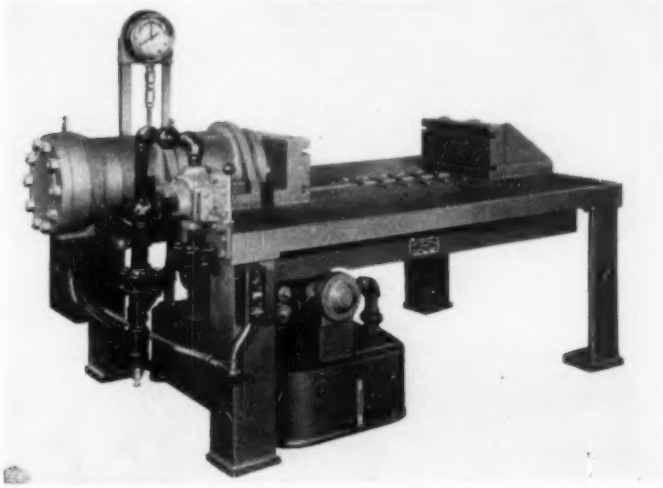
PRESSES—*The Denison Engineering Co., Columbus, Ohio.* Standardized line of 1- to 35-ton oil-hydraulic presses are available in seven standard sizes each of which is designed for specific dimensional and tonnage requirements.

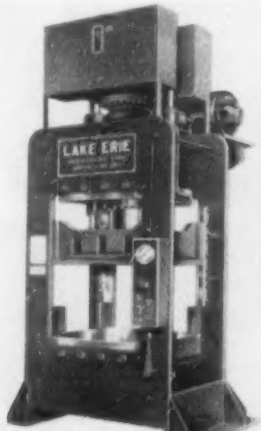
LAMINATING PRESS — *Studebaker Mfg. Co., 1221 South 9th Ave., Maywood, Ill.* Electrically heated platens and hydraulic pressure make this hydraulic laminating press especially adaptable for plastic laminations and other operations requiring controlled heat and pressure.



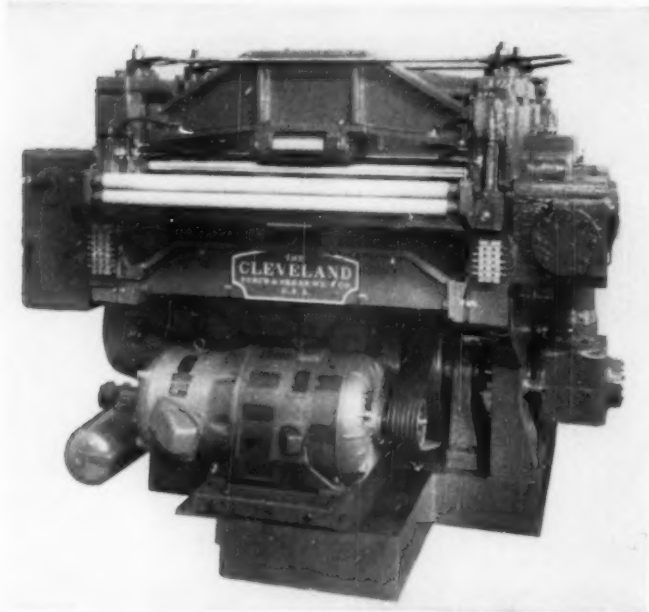
SINGLE-ACTION PRESS—*E. W. Bliss Co., General Office, 1420 Hastings St., Toledo 7, Ohio.* The simplified design of the HS-650-H-36-36, 650-ton hydraulic press includes the elimination of interconnecting piping, a simplified circuit, and a dual-flow pumping system.

BENDING PRESS—*R. D. Wood Co., c/o Harris D. McKinney Organization, 12 South 12th St., Philadelphia 7, Pa.* Self-contained 30-ton bending press is for general shop work in bending and straightening bars, rods, and light structural sections. The work table is 3x4 ft. ↓





METAL-FORMING PRESSES—*Lake Erie Engineering Corp., Buffalo 17, N. Y.* Series DF presses are available in 100-, 150-, and 200-ton capacities. The basic unit in each size is a single-action, downstroke, front and back plate, gib-guided press, lever controlled.



SHEAR — *The Cleveland Punch and Shear Works Co., Cleveland 14, Ohio.* Automatic shear with roll feed has a capacity of 48 in. of 1/16-in. steel, Rockwell 90 B scale. It is equipped with an electrically controlled positive-jaw clutch.

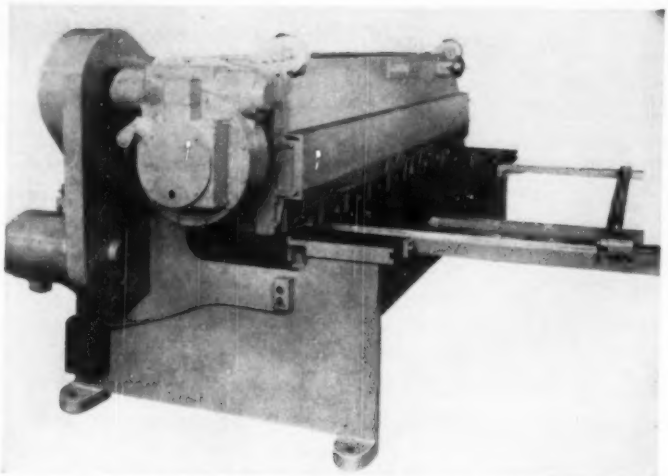
SLITTING SHEAR — *Beverly Shear Mfg. Co., Chicago, Ill.* Portable slitting shear has a capacity of ⅛ in. in mild steel and 10 gage in stainless. Shear blades are interchangeable and adjustable.

→

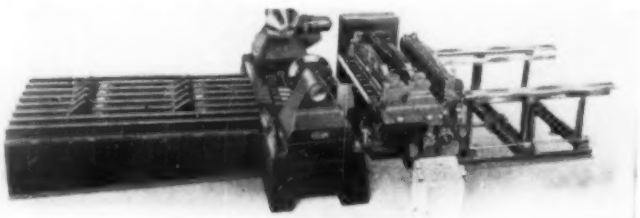
SHEAR — *The Cleveland Punch and Shear Works Co., Cleveland 14, Ohio.* Cleveland automatic shear is equipped with loading table, automatic uncoiler, roll feed, and stacker, all synchronized to operate as a combined unit.

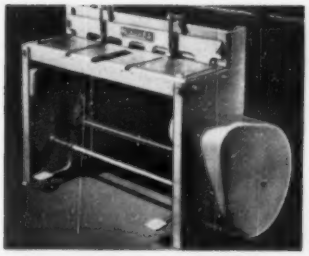
SQUARING SHEARS — *Wysong and Miles Co., 69 Fulton St., Greensboro, N. C.* Squaring shears ranges in cutting lengths from 36 to 120 in. Seventy-five- to 85-psi air pressure is needed for operation.

SHEARING ATTACHMENT — *Diamond Machine Tool Co., 5439 E. Olympic Blvd., Los Angeles 23, Calif.* With the Diamond shearing-die attachment, Model 3048 Multi-Max punch press can be converted into a 10-gage, 48-in. power squaring shear in approximately 15 min.

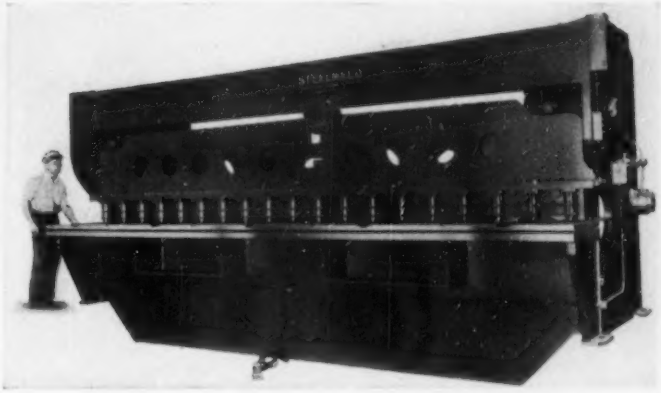


SQUARING SHEARS—*Columbia Machinery and Engineering Corp., Hamilton, Ohio.* Columbia steel squaring shears are equipped with motor-operated precision back gages, solenoid-operated clutches, movable foot-switch controls and are of low overall height.





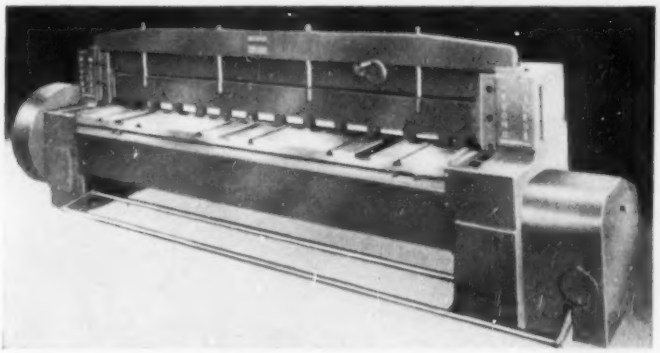
POWER SHEARS—*Niagara Machine and Tool Works, 637-697 Northland Ave., Buffalo 11, N. Y.* Niagara Power Shears can operate continuously at 125 strokes per min on mild steel up to 20 gage. Arched openings provide full visibility of the cutting edge.



SHEAR—*The Cleveland Crane Engineering Co., Wickliffe, Ohio.* Shearing action is controlled by an electrically operated foot switch on the steel-weld shear. Capacity is 18 ft of 3/16 in. mild steel at 50 strokes per min.

SQUARING SHEAR—*Wysong and Miles Co., Greensboro, N. C.* No. 10-10 power squaring shear with 10-ft, 10-gage mild steel capacity has bed, end-frames, knife-bar, hold-down, and top-girder of one-piece castings.

SHEAR—*The Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati, Ohio.* The Cincinnati all-steel shear is available with a remote-control electric-clutch attachment, for large volumes of wide or long plates and sheets.

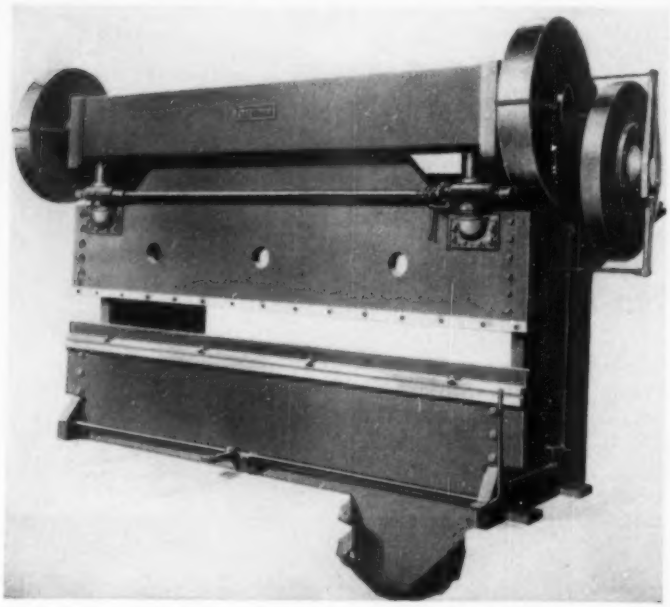


BENCH SHEAR, ROD CUTTER—*Manufacturers Products, Crest Ave., East Haven, Conn.* Hercules No. 0 bench shear and rod cutter is a general-purpose tool that can be adapted for production purposes as well as for making samples and templets in tool and die work.

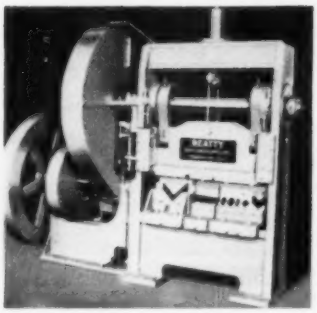
SHEAR—*The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Improved type of cam- and lever-actuated shear cuts off flat strip stock. Shear takes blades to 0.045 in. thick and 1¼-in.

SHEAR—*The Black & Decker Mfg. Co., Towson 4, Md.* Porto-Shear will cut 12-gage standard sheet steel and approximately two gages thinner in Monel metal and stainless steel and approximately 50% above the rating in sheet copper, aluminum, lead, and other non-ferrous metals.

POWER SHEARS—*O'Neil-Irwin Mfg. Co., Lake City, Minnesota.* Precision power shears are for accurately and rapidly cutting square, rectangular, and other straight-sided blanks, shearing narrow strips, and trimming edges of sheets or parts. Top cutting capacity is 16-gage sheet steel. This precision machine is offered in 12- and 24-in. sizes.



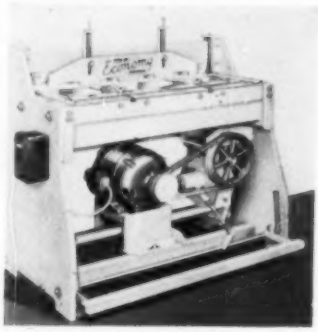
POWER PRESS BRAKES—*Columbia Machinery and Engineering Corp., Hamilton, Ohio.* Brakes include a complete range of sizes from 120 to 900 tons. Models are available for forming mild steel ⅛ in. to 1 in. thick in lengths from 4 to 20 ft.



SHEAR—*Beatty Machine & Mfg. Co., Hammond, Ind.* The Guillotine Bar Shear is for cutting rounds, angles, bars, and squares without changing tools. It is available in capacities from 50 to 450 tons.

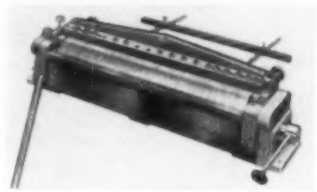
PRESS BRAKE — *Verson All-Steel Press Co., 9316 S. Kenwood Ave., Chicago 19, Ill.* Suitable for most metal forming ordinarily performed on press brakes, the Verson 16-48 air-bending capacity is rated from a 48-in. length of 16-gage stock over a ½-in. opening to a 24-in. length of 10-gage stock over 1⅛-in. opening.

RADIUS BRAKE—*O'Neil-Irwin Mfg. Co., 311 8th Ave., Lake City, Minn.* A radius-forming brake with 24-in. capacity, No. 4, is for the forming of materials of low ductility which fracture if formed to a sharp bend.



METAL SHEAR — *Acme Equipment Co., Inc., 126 S. Clinton St., Chicago, Ill.* Power-operated 16-gage capacity metal shear has a self-contained direct-drive unit. The Economy P-16 shear eliminates flywheels, brakes, fast-moving shafts, and cam-operated connecting rods by utilizing the direct drive.

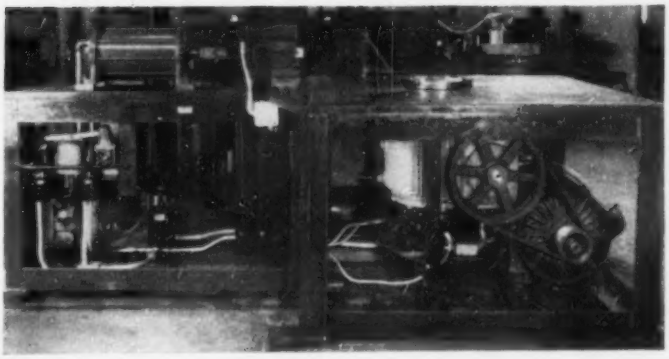
HAND BENDER—*The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.* For general bending of tubing up to 3-in. dia, the Model 848 tube bender accommodates thin- or heavy-wall copper and aluminum-alloy tubing, and light- or medium-gage annealed steel tube.

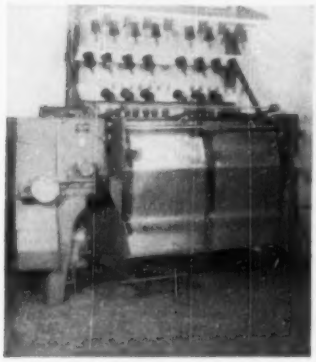


BRAKE—*Berkroy Products Inc., 2516 N. Ontario St., Burbank, Calif.* Finishing metal edges for straight seams and hems of many types, metal trim, flanges, tabs, boxes, and pans are typical operations of the Berkroy 24-in. box and pan brake.

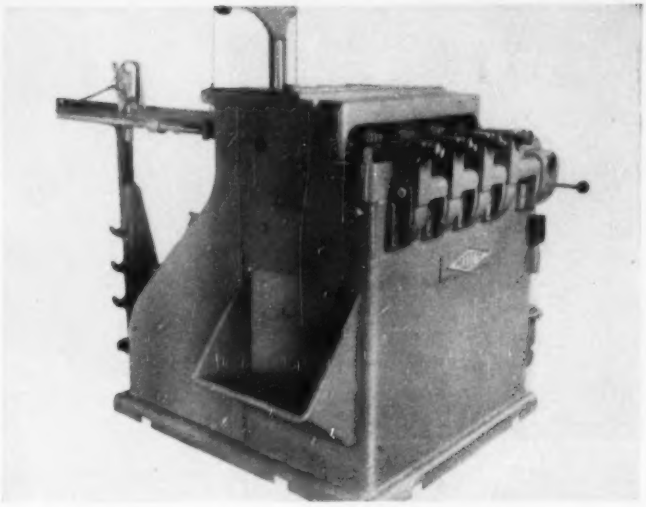
PRESS BRAKE—*The Cyril Bath Co., 6919 Machinery Ave., Cleveland 3, Ohio.* Incorporating both automatic press-control safety mechanism and automatic overload protection, this high-speed press brake has a 35-ton capacity and a 15x42-in. die area.

POWER BENDER—*Hancock Tool & Die Corp., 17005 Fullerton Ave., Detroit 27, Mich.* Basic operating components of the Hancock power bender are a rotary fixed drive and a pressure-cylinder arrangement for bending work to the shape of the fixture, as the fixture revolves. The machine has all-electric controls in both manual- and automatic-cycle operations. →





COIL WINDER—*Globe Tool & Engineering Co., 436 Davis Ave., Dayton 3, Ohio.* Globe winding machine winds coils requiring insulation paper between layers. Ignition coils, transformers, ballasts, and other coils having a definite space and insulation requirement are wound automatically at high speeds.



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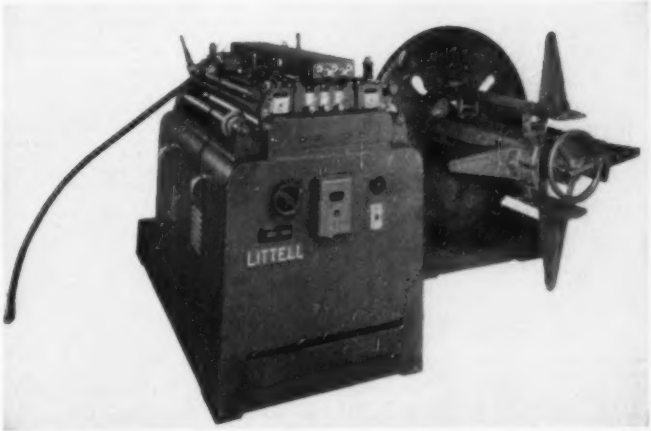
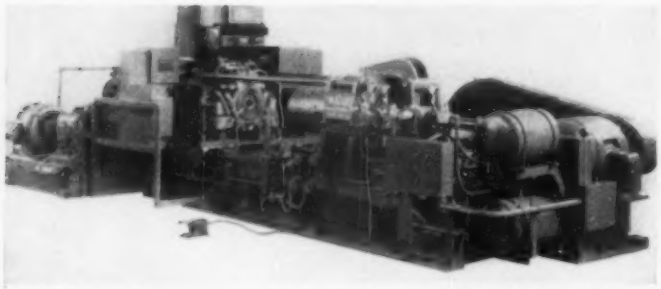
FORMING MACHINE — *The Producto Machine Co., Bridgeport, Conn.* Four-spindle Bar-Matic machine handles high-speed production of external forming, grooving, beveling, chamfering, and cutting-off of bar stock.

BENDER—*J. A. Richards Co., Kalamazoo, Mich.* Air-operated model bender for fabrication of irregular-shaped metal parts will handle up to 3/16 x 1½-in. wide hot- or cold-rolled aluminum, plastic, or copper alloys.

PLATE-BENDING ROLLS—*Webb Corp., Webb City, Mo.* Vertical plate-bending rolls are designed for rolling large-diameter cylinders of light plate where true diameters must be held during the bending process.

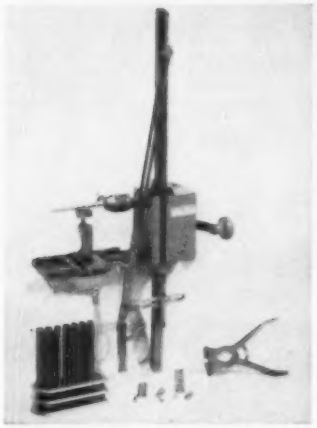


STRAIGHTENER AND REEL—*F. J. Littell Machine Co., 4169 Ravenswood Ave., Chicago 13, Ill.* Unit is complete with a 7-roll straightener. Reel is the automatic-centering spindle type and is equipped with an electric brake to apply when power is off on the straightening machine.

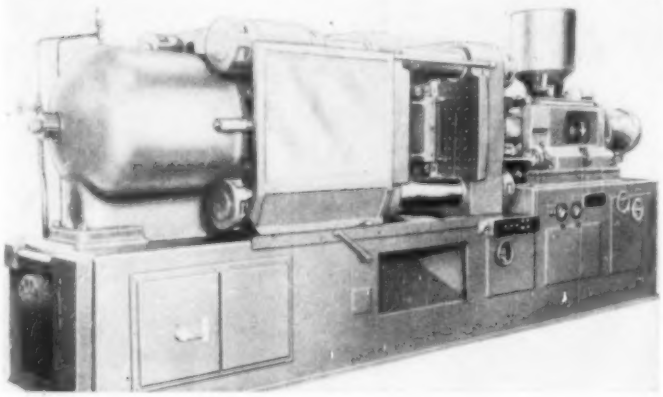


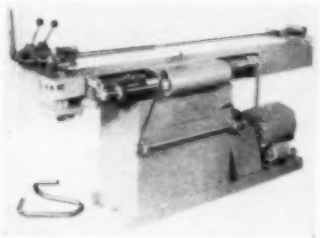
FORMING MACHINE—*The Federal Machine and Welder Co., Warren, Ohio.* Equipped with removable dies, the Westin general-purpose machine is suitable for a variety of job applications. The forming cycle is fully automatic.

PLASTIC MOLDING MACHINE—*Jackson & Church Company, Saginaw, Mich.* This 24-48-oz plastic molding machine for universal injection has 20 to 50% faster cycle and complete and uniform pre-plasticizing. Low injection pressures are 3000 to 5000 psi.

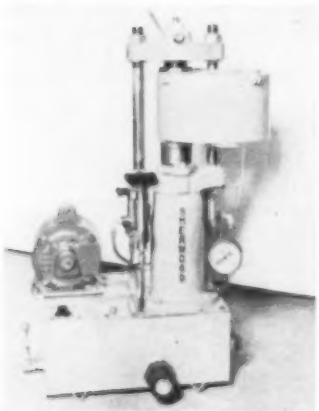


SPRING-COILING MACHINE — *The Carlson Co., 277 Broadway, New York 7, N. Y.* Carlson No. 1 is a semi-automatic machine for winding both left- and right-hand compression, extension and torsion springs.





BENDER — *Pines Engineering Co., Aurora, Ill.* Capable of producing from 100 to 400 bends per hr, depending upon the size and length of material, the semi-automatic hydraulic Series 1400 bender has a maximum capacity of 1-in.-OD, 16-gage steel tubing with maximum bending radius of 8½ in. to centerline of tube.



INJECTION PRESS — *Alexander Saunders & Co., New York, N. Y.* The Sherwood heavy-duty wax injection press is for volume production of wax patterns for industrial precision castings. The machine consists of a hydraulic pressure cylinder and a revolving drum, containing either four or five cylindrical containers. Each container has 78-cu-in. capacity.

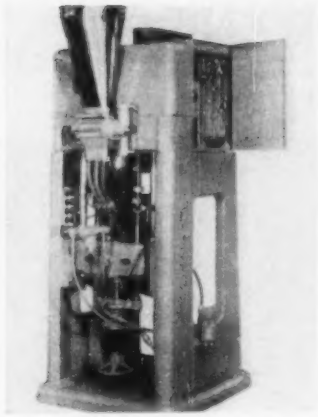
MOLDING MACHINE—*Watson-Stillman Co., Roselle, N. J.* Provided with an automatic stuffing arrangement which increases its rate capacity by 40-50%, the W-S 48-oz automatic injection molder is arranged for individual motor drive and powered by radial-piston-type oil-pumping equipment.

COMPRESSING MACHINE—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* High-speed rotary compressing machine handles abrasive materials such as powdered glass, ceramics, and powdered metals. Compressed parts to ½-in. dia. can be produced at rates up to 300 parts per min.

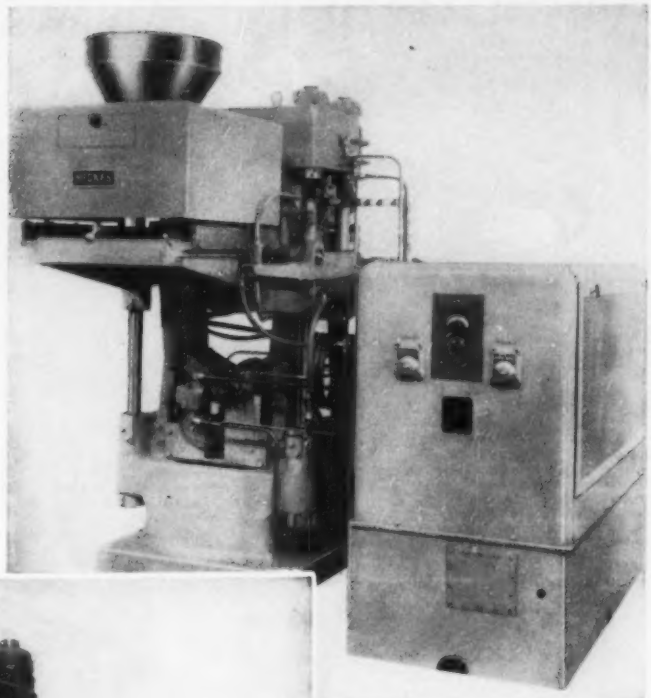
MOLDING PRESS—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* Automatic molding press is self-contained and provided with a special checking device to control the automatic action of press through ejected part.

EXTRUSION MACHINE — *Welding Engineers, Inc., Norristown, Pennsylvania.* The double-worm Compounder-Extruder mixes plasticizers, fillers, and stabilizers and then extrudes or palletizes the finished compound.

COLD-BAR BENDER—*Winfield R. Scott, manufacturer; Graybar Electric Co., 420 Lexington Ave., New York 17, N. Y. distributor.* Cold bends can be made in copper, aluminum, brass, and mild steel with the form-bar bender. It will handle bar in strips from ⅛ x 1 in. to ½ x 6 in. in cross section.

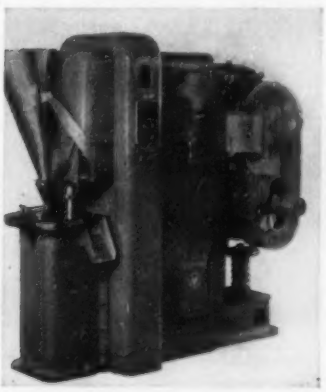


PRESS—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pennsylvania.* Alkyd-Resin press is designed for molding fast-curing alkyd resins.

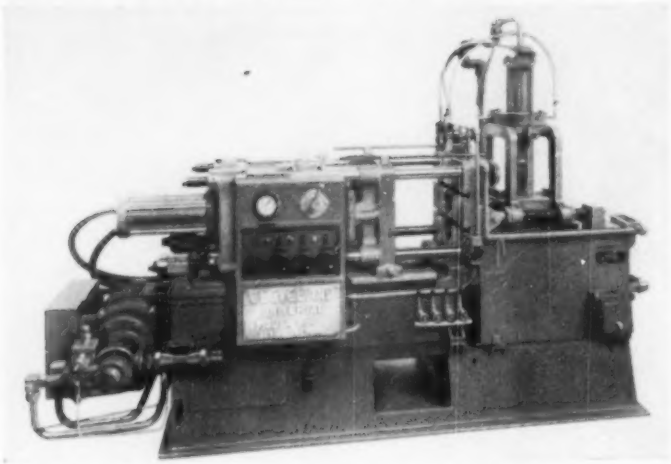


CLOSURE PRESSES — *F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20,* Pa. Automatic 50- and 150-ton closure presses produce closures or threaded parts in large quantities at low cost. Production example is 5400 24-mm closures molded per hr on the 150-ton model.

MOLDING MACHINE—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* Semi-automatic plastics molding machine has a 200-ton straight-ram-type hydraulic press. Model 723 is suited for general-purpose molding.

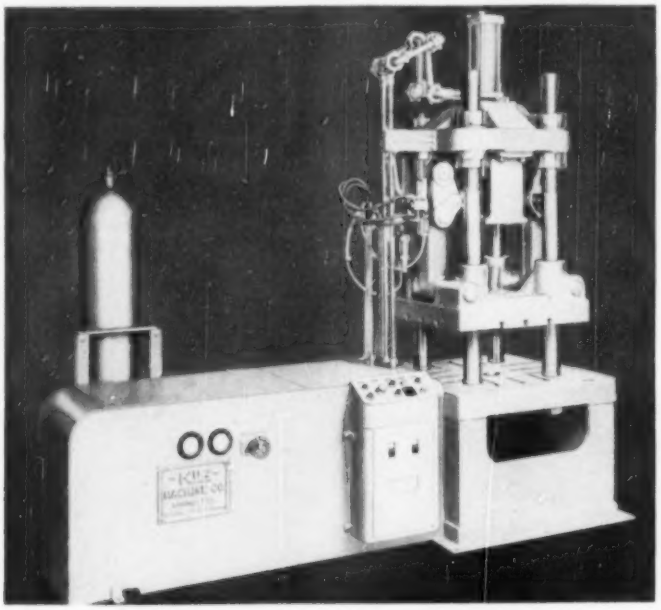


PREFORMING PRESS—*Arthur Colton Co., 2600 East Jefferson Ave., Detroit 7, Mich.* Fifty-five-ton preforming press preforms and molds plastics, powdered metals, generator brushes made from carbon and copper mixtures, and ceramic products. Series 55 is capable of producing 50 preforms a minute and is designed for making round and odd shapes.



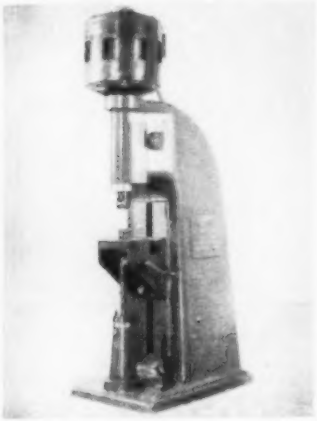
DIE CASTER—*The Cleveland Automatic Machine Co., 4932 Beech St., Cincinnati 12, Ohio.* Model 50 is a high-pressure hydraulic unit which can be furnished either as a cold-chamber machine for casting aluminum or as a goose-neck type for casting zinc, tin, or lead.

DIE-CASTING MACHINE—*Kux Machine Co., Chicago, Ill.* Model HP-22 vertical-type die-casting machine, for production of parts with inserts has its die plates mounted in a horizontal position while die plates operate in a vertical direction. It will produce castings weighing 4½ lb in aluminum.



HEADING HAMMERS—*The Carboloy Co., Inc., Detroit 32, Mich.* Combination bolt head-and-marking hammers, for automatic bolt-heading machines, make it possible to eliminate the separate marking operation in the manufacture of bolts, rivets, and screws.

DIE-CASTING MACHINE—*Dept. D-4, Reed Prentice Corp., Worcester 4, Mass.* For high-speed production of die castings of lead, tin, or zinc base alloys. Model 10 has maximum shot capacity of one pound (zinc) and will produce up to 600 shots per hr.

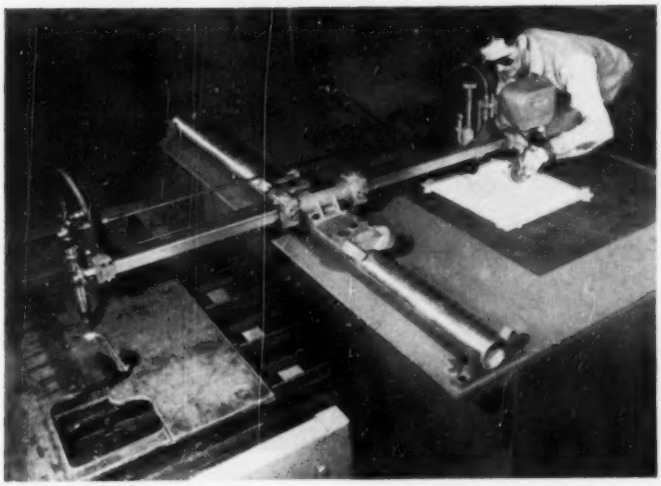


RIVET HEADER—*The Grant Mfg. & Machine Co., 85 Sillman Ave., Bridgeport 5, Conn.* Rivets of any diameter up to a maximum capacity of ¾ in. and in special applications up to 1 in. are handled by this machine.

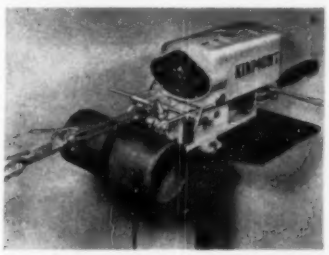
AIR IMPACT HAMMER—*Blank Machine Tool Co., 3101 E. Michigan Ave., Jackson, Mich.* For use in metalworking, plastics, and textile shops the Bryant Model Z-6 hammer is good for light stamping, small forgings, straightening steel castings, trimming, molding, crimping, coining, riveting, and other uses.

IMPACT AIR HAMMER—*Mead Specialties Co., Dept 1H4, 411 N. Knox Ave., Chicago 44, Ill.* The Model 105 impact air hammer has a capacity of 15,000 lb at point of impact. The working surface of the table is 7x9 in.

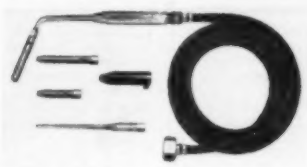
Welding and Heat-treating



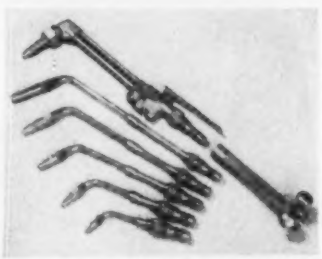
SHAPE CUTTER — *Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Oxyacetylene shape-cutting machine cuts steel up to 8-in. thickness in any shape within a 36x32-in. area at speeds ranging from 3 to 30 in. per min.



CUTTING-TORCH ATTACHMENT—*Kinmont Mfg. Co., Inc., 716-718 West Wilson Ave., Glendale 3, Calif.* Kinmont universal power unit maintains a smooth bevel and a square cutoff. Pipe from 3-in. to 36-in. dia and on tanks up to 10-ft dia. can be accommodated.

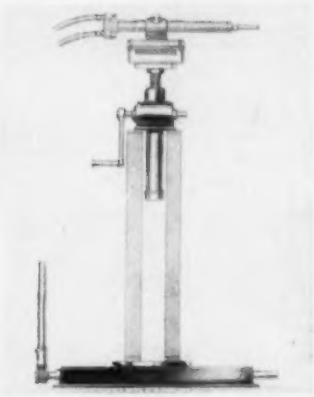


SOLDERING OUTFIT — *Air Reduction Sales Co., 60 E. 42nd St., New York 71, N. Y.* The Airco No. 75 air-acetylene outfit is for all kinds of small soldering, low-temperature brazing, heading, or lead-burning jobs.



WELDING TORCHES—*Smith Welding Equipment Corp., Minneapolis 14, Minn.* Oxyacetylene welding torches and cutting assemblies are made in three sizes. All three series of torches incorporate the Flo-Trol feature which prevents conditions leading to premixing of gases and backfire.

WELDING TORCH—*Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.* The Heliarc HW-8 will spotweld mild steel, low alloy, and stainless steel from 0.030 to 0.064 in. thick with currents from 155 to 250 amperes. Welds can be made from only one side of work.



BEVELING MACHINE—*The Duff-Norton Mfg. Co., 2709 Preble Ave., Pittsburgh 30, Pa.* Making the beveling-machine frame, used in welding tank-sheet edges vertically mobile eliminates the problem of raising and lowering tank to accommodate height of frame.

WELDING TORCHES — *Weldit Inc., 990 Oakman Blvd., Detroit 6, Mich.* Torches designed to use atmospheric air and either propane or acetylene are for plumbers, electricians, painters, and tinners.

TORCH—*The Liquid Carbonic Corp., 3100 South Kedzie Ave., Chicago 23, Ill.* Welding and brazing torch has all-braze construction with rear end designed for easy hose connections. The Model AV-10 lightweight torch converts into a cutting torch by use of WC-10 cutting attachment.

REGULATORS—*Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif.* Small single-stage regulators, the Midget 7400 Series are for small acetylene cylinders where hourly gas consumption and space are limited. Weight per unit is 1 lb, 12 oz.

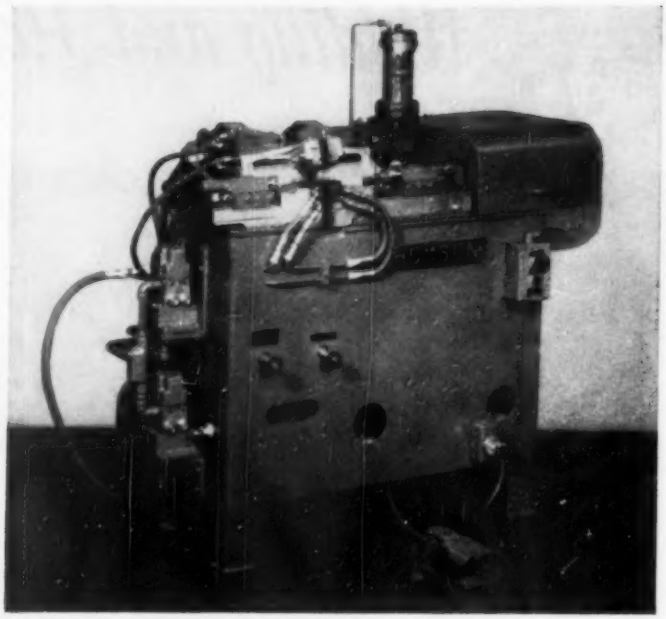
SCARFING TORCH—*Air Reduction, 60 E. 42nd St., New York 17, N. Y.* The Airco scarfing torch has a gas capacity of 5000 cfh at 100 psi, a flow rate permitting high output per man hour. Constructed of stainless steel, monel, and aluminum, it weighs 6 lb.

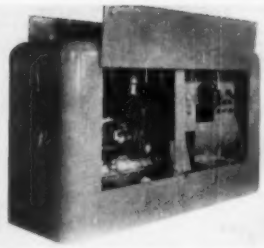
WELDING KIT—*All-State Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.* Compact welding kit contains low-temperature alloys and fluxes for any gas-welding job. The kit comes in a metal box and is known as the All-State DOC Alloys Kit.

WELDER—*Hobart Bros. Co., Troy, Ohio.* Inert-gas welder can be used either as an ordinary transformer welder, or can be switched on for inert-gas shielded welding.

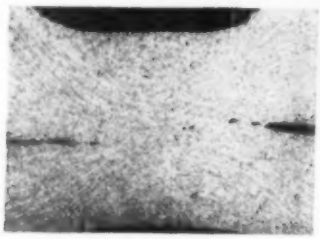
AC WELDER—*The Lincoln Electric Co., Cleveland 1, Ohio.* "The Fleetwelder 200" is a NEMA rated unit with reserve capacity over its rated maximum load of 250 amp ac. Electrodes ranging from 5/64- to ¼-in. dia can be accommodated.

WELDER—*Graham Mfg. Corp., 1541 E. Eight Mile Road, Ferndale 20, Mich.* The Graham welder is a capacitor-operated, self-timed device using tip studs which, on coming in contact with the work and fusing, cause ionization. The unit welds steel, stainless steel, monel, aluminum, magnesium, zinc, copper, and combinations of these metals.



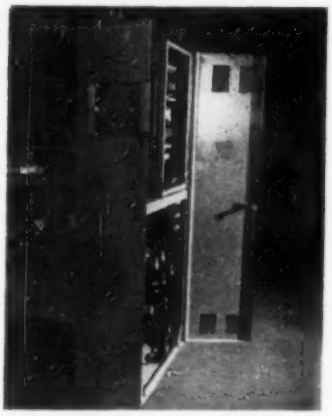


ARC WELDER—*Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.* The Wilson 36A "Yellow Jacket" arc welder is said to be best suited for pipeline work or construction jobs where ruggedness and durability are important factors.



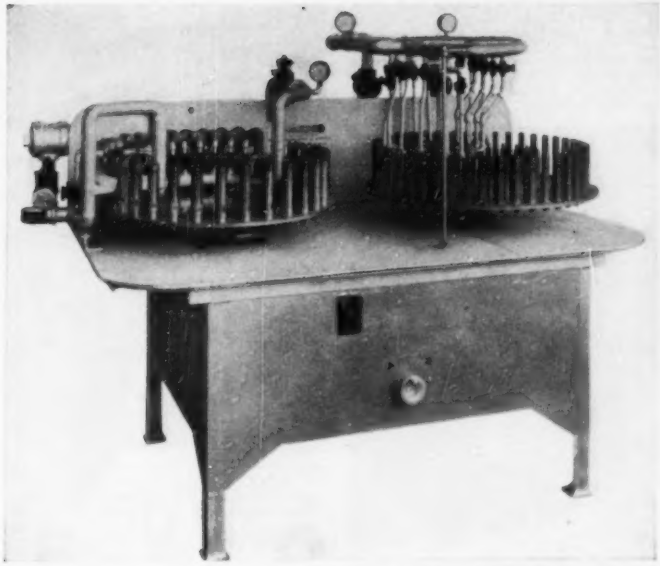
COLD PRESSURE WELDING—*Koldweld Corp., Suite 4408, 10 East 40th St., New York 16, N. Y.* The Koldwelding metal joining process, developed by General Electric Co. Ltd., England, has been successfully applied to aluminum and its alloys, cadmium, lead, copper, zinc, and silver.

FLASH WELDER—*Thompson Electric Welder Co., Lynn, Mass.* The Thompson Synchro-Matic flash welder provides automatic control of flashing and upset with the entire welding sequence synchronized and reduced to a push-button process.



SINGLE-PHASE CONTROL—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh, Pa.* Single-phase to single-phase low-frequency electronic welding control is said to have lower kva demand and a higher power factor than the standard single-phase to single-phase control.

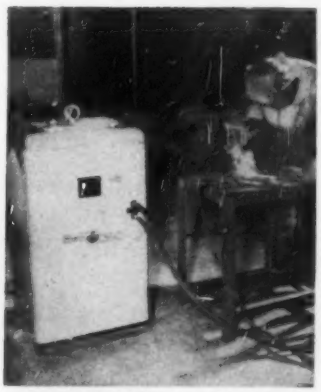
ARC WELDER—*Air Reduction Sales Co., 6 E. 42nd St., New York 17, N. Y.* Wilson 200-amp max MCT ac transformer arc-welding machine is a portable unit designed for small-shop use. It has a rated maximum output of 200 amp.



BRAZING MACHINE—*Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa.* Special-purpose automatic machine employs closely controlled radiant gas heat in silver-alloy brazing of brass sub-assemblies. The machine brazes eleven joints on 540 units per hr by the Selas Gradiation method.

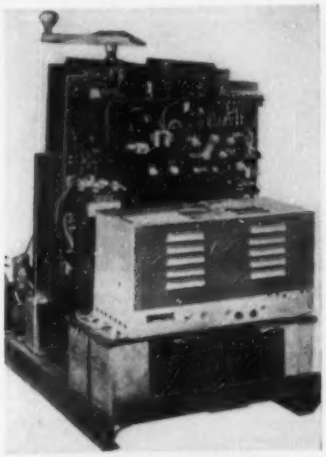
WELDING PROCESS—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* The Aircomatic welding process consists of the continuous feeding of a coiled-wire electrode in a gaseous shield through the barrel of a welding gun. High-speed continuous deposition of filter metal is possible.

WELDER—*Martin Wells, Inc., 5886 Compton Ave., Los Angeles 1, Calif.* Operating under continuous-duty cycle of 725 amp with ⅝-in. electrodes, the Martin Wells heavy-duty 6S electrode holder is said to remain cool. It is 15 in. in length and weighs 32 oz.

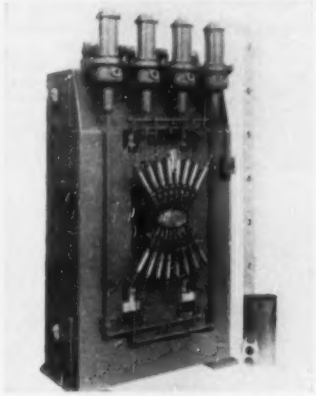


DC WELDER—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* Through the development of a small, light, efficient, rectifier, Westinghouse has produced a dc welding machine said to include the advantages of both ac and dc units. The welder consists of a transformer, an adjustable reactor, and a full-wave rectifier.

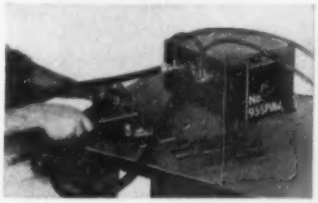
ARC WELDER—*The Lincoln Electric Co., Cleveland 1, Ohio.* Operating off a 110-v light circuit, small arc welder is reported to have design and operating characteristics comparable to larger industrial welders.



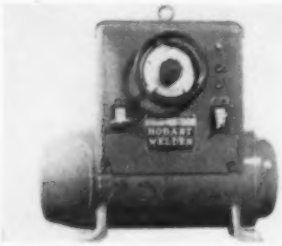
WELDER—*National Cylinder Gas Co., 840 North Michigan Ave., Chicago 11, Ill.* Regardless of working or weather conditions the Sureweld Gasarc high-frequency welder remains on the assigned frequency of 27,120 kilocycles.



WELDER—*Taylor-Winfield, Warren, Ohio.* Air-speed multiple-electrode resistance welder utilizes the compact hydraulic gun, at the same time eliminating the need for a hydraulic pumping unit.

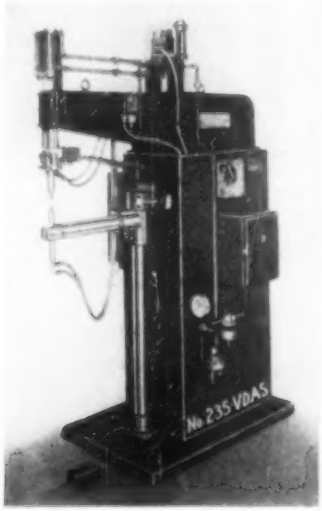


WELDER—*Eisler Engineering Co., Inc., Newark, N. J.* Electric sputter welder is designed for light metals, especially thin hollow articles made from nickel silver, low-carbon and stainless steel, and brass. Welding machine is used as a preparatory tool for a following soldering operation.



HOBART WELDER — *Hobart Bros. Co., Troy, Ohio.* With five ranges of welding current and 100 steps of volt-ampere adjustment in each range, the "Bantam Champ" DC arc welder makes available 500 combinations of open-circuit voltage and welding current.

ARC WELDER—*Mfg. Div., Groban Supply Co., 1507 South Michigan Ave., Chicago 5, Ill.* Model 202 arc welder has continuous welding rating of 200 amps and intermittent rating of 250 amps. It handles anything from light-gage sheet metal to ¼-in. plates.

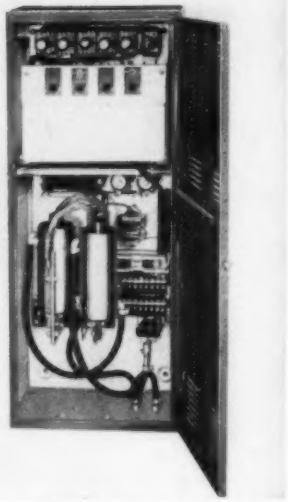


SPOTWELDER—*Etsler Engineering Co., Inc., 750 South 15th St., Newark 3, N. J.* Press-type spotwelder is operated by a double-acting air cylinder. Electrode holders are adjustable up to 24-in. opening between arms. Repeating strokes are possible up to 120 per min.

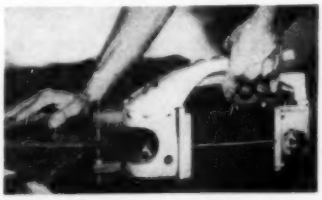
WELDER—*J. B. Borgadt, 2036 E. 86th St., Cleveland 6, Ohio.* Electric resistance welds that may be flash welds, butt welds, or modifications thereof, are produced by the Borgadt electric tube welder. Surface contact conveys the current across the seam cleft in preformed tubing to fuse the metal.

ARC WELDERS—*The General Electric Co., Schenectady 5, N. Y.* AC arc welders have stepless precision current control and are available in 200-, 300-, 400-, and 500-amp models for indoor manual welding; 750- and 1000-amp models for machine and submerged-melt welding; and a special 200-amp model for light-duty job-shop welding.

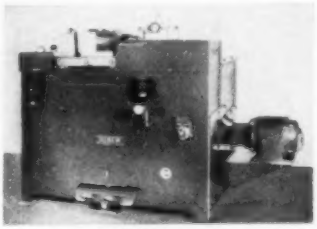
SPOTWELDER — *Greyhound A.C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y.* Weighing only 23 lb, the Greyhound portable spotwelder is said to be sturdy enough for heavy-duty industrial work. It is available in both 110- and 220-volt ac models, 50-60 cycles, and welds up to ⅛-in. combined thickness of metal.



SPOTWELDER CONTROL—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Class 8992 electronic combination units include NEMA type 3B timers and ignition-tube contactors for complete control of spot-welders. The timer will operate at repeat speeds of over 400 welds a minute.



SPOTWELDER — *Tool and Equipment Distributors, 636 South 10th Ave., La Grange, Ill.* "Big Shot" is a 22-lb portable spot welder which can be operated with only one hand. The 220-volt units weld up to ⅛-in. thickness.

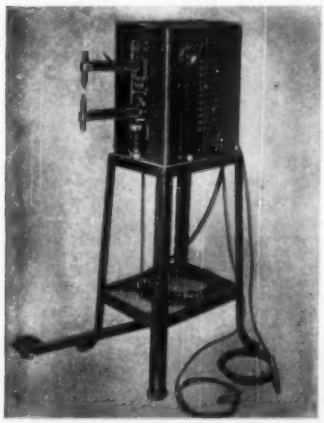


FLASH WELDER—*Agnew Electric Co., Milford, Mich.* Type HAB, hydraulically operated flash welder is automatic except for loading and unloading. Height to the platen is 36 in.; floor space is 3x4 ft.

←

PORTABLE SPOTWELDER — *The Welderon Co., 703 Industrial Trust Bldg., Providence 3, R. I.* Designed to be brought right to the job, the Welderon can be plugged into any 115-volt, 60-cycle, 25-amp outlet.

FLASH-BUTT WELDER—*Rex Welder and Engineering Co., Kansas City, Mo.* Pushbutton flash-butt welder is for pipe and tubing. Welding heads are swivel mounted so that two pieces can be butt-welded or flash butt-welded at an angle.

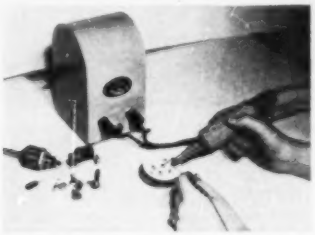


WELDER—*Delta Mfg. Div., Rockwell Mfg. Co., 600 E. Vienna Ave., Milwaukee 1, Wis.* Three welders, a Dual-Weld combination spot and arc welder, the 3-kva spotwelder, and the portable 120-amp arc welder are offered.

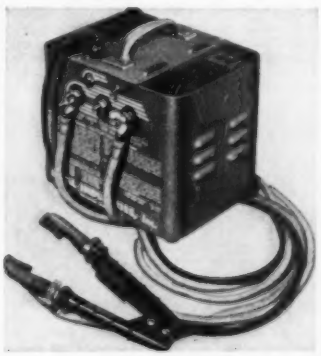
SOLDERING IRON—*Kemode Mfg. Co., Inc., 161 W. 18th St., New York 11, N. Y.* The Quik-Shot soldering iron needs no electricity, flame, or external heat of any kind. A chemical cartridge heats the iron to working temperature of 800 F in 5 sec and maintains that heat for seven minutes.

COLD SOLDER—*Alvin Products, Inc., 20-22 Houghton St., Worcester 4, Mass.* Lab-Metal all-purpose cold solder is applied with an ordinary putty knife and fills blow holes, sand holes, surface blemishes and rough or porous places in metal castings. It is said to harden in minutes.

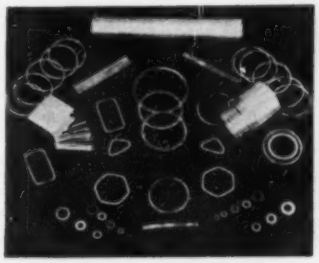
SOLDERING MACHINE — *Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.* Work capacity of this soldering machine is approximately 1000 pieces per hr depending upon the gage of the metal to be soldered and the area to be heated.



SOLDERING TOOL—*Luma Electric Equipment Co., Toledo 1, Ohio.* Operating on the resistance-heating principle, this tool will accommodate electrodes of 3/32-, 1/8-, and 5/32-in. in either the single- or double-contact construction. Soldering heat is instantaneous.

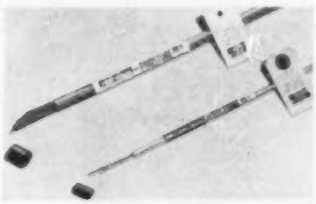


SOLDERING TOOL—*Ideal Industries, Inc., Sycamore, Ill.* A 450-watt, light-duty Thermo-Grip soldering tool operates on the resistance-heating principle, and heats the part almost instantly.

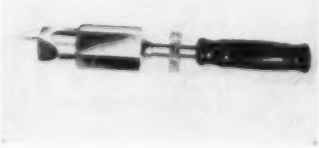


SOLDER — *Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.* Preformed in rings, pellets, washers, and unusual shapes and sizes to specifications, Kester solder is said to insure uniform results where continuous or repetitive soldering is required.

SOLDERING UNIT—*Durst Mfg. Co., 1110¾ Cumpston St., North Hollywood, Calif.* Based on the principle of generating heat in the work instead of applying it externally, this bench fixture for soldering ferrules to flexible conduits can be operated either by non-locking foot switch or toggle switch.

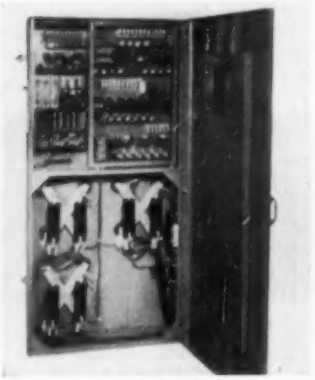


SOLDER, BRAZING RODS—*All-State Welding Alloys Co. Inc., 273 Ferris Ave., White Plains, N. Y.* The "Silfube" No. 1 transparent semi-rigid shatter-proof plastic tube contains 1 oz of low-melting-point silver brazing rod, and the "Phostube" No. 4 contains 4 oz of Phosphor-Copper Brazing Rod.

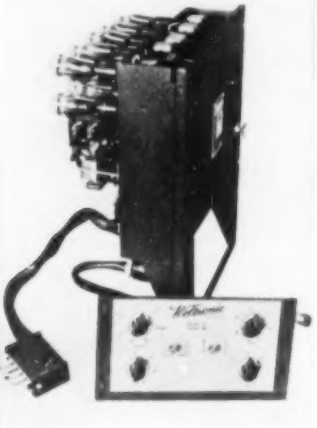


SOLDERING IRON—*Hexacon Electric Co., 135 W. Clay Ave., Roselle Park, N. J.* Heavy-duty 700-watt soldering iron has a replaceable 1¾-in. dia screw-type tip. It operates on any cycle, ac or dc, and is furnished for either 110 or 220 volts.

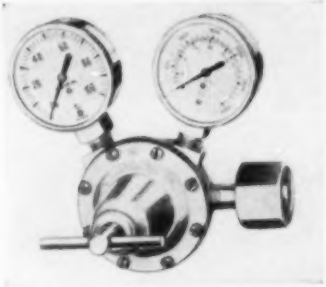
ELECTRODE DRESSER—*Arc Equipment Corp., Bryan, Ohio.* Model 7165 is equipped with a cutter for reshaping copper electrodes on spotwelding machines without removing the tips from the machines. The tool weighs only 3½ lb, has ¼-in. pipe air inlet and is 10⅝ in. over-all length.



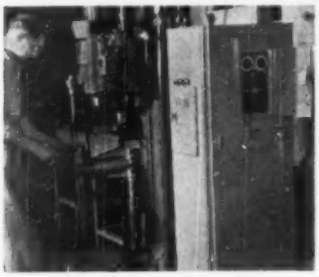
WELDING CONTROL—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* Three-phase low-frequency welding control draws power from a 3-phase line and converts it to ⅙ lower frequency, single-phase for resistance welder electrodes.



WELD TIMERS—*Weltronic Co., 19420 W. 8-Mile Road, Detroit 19, Mich.* Relay firing timer employs standard octal-base thyraton tubes and is designed for interchangeable front or side mount of timer dials when employed in a standard control combination.



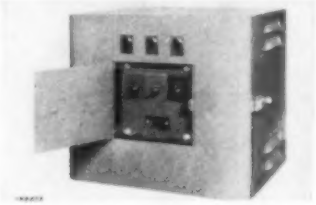
WELDING REGULATORS—*C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colorado.* Single-stage welding regulators for oxygen and acetylene are said to equal the performance of most two-stage regulators. They are the yoke type and hold the secondary pressure while tank pressure falls.



CONTROL UNIT — *General Electric Co., Schenectady 5, N. Y.* General Electric unit provides the desirable refinement of gradual increase in welding current at the beginning of the weld. It is adaptable for either synchronous or non-synchronous single-phase resistance-welding machines.

ELECTRODE HOLDERS — *General Electric Co., Schenectady 5, N. Y.* Manual electrode holders in 100-, 200-, 400-, and 800-amp ratings, and machine electrode holders in ratings from 400 to 800 amps are available.

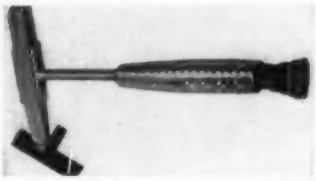
WELDER HEAT CONTROLS — *Square D Co., 4041 N. Richard St., Milwaukee 12, Wis.* Class 8990 heat controls provide stepless adjustment of welding current from 20 to 100% on 440 volt systems, or from 40 to 100% on 220 volt systems.



WELD ENERGY COMPARATOR — *Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.* Comparator can be used with any Westinghouse single-phase spotwelding control. It is provided with a sensitivity adjustment which may be set to any value required for the work.

BRAZING ROD—*All-State Welding Alloys Co. Inc., 273 Ferris Ave., White Plains, N. Y.* Flux-coated nickel-silver brazing rod is for application with the oxyacetylene blowpipe. It brazes with high strength (tensile above 85,000 psi, shear above 160,000 psi).

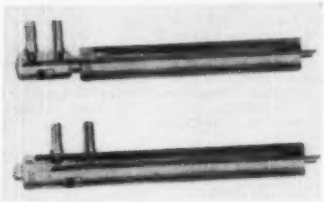
WELDER CONTROL—*Westinghouse Co., Pittsburgh, Pa.* Remote-control unit for use with Westinghouse 65 line of ac welders permits operator to change current setting and adjust arc without walking back to machine.



REPEATER BRUSH—*Bernard Welding Equipment Co., 741-743 E. 71st Street, Chicago 19, Ill.* Incorporated into the handle of the Bernard Multi-Pic Weld cleaning tool, this brush is designed to reach into deep corners and crevices.

SPOTWELDER STAND — *Greyhound A.C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y.* A foot lever on the lightweight-steel stand for this portable self-operating spotwelder frees both the operator's hands to hold the work. The welder is held by two metal brackets.

HARDFACING ALLOYS—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Line of hardfacing alloys is divided into three primary groups: ferrous alloys, cobalt-base alloys, and tungsten carbide. A total of 15 are available.



ELECTRODE HOLDER—*P. R. Mallory & Co., Inc., Indianapolis, Ind.* Bench-type welding electrode holder, using standard packaged electrodes, has a full 180° range of head adjustment with positive locking in any position under full operating pressures.

ARC STABILIZER—*Mid-States Equipment Corp., 2429 So. Michigan Ave., Chicago 16, Ill.* Automatic arc stabilizer offers a circuit and remote control which reduces radio interference resulting from high-frequency arc-stabilized welders.

ELECTRODE—*All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.* General-purpose electrode is for maintenance and production work on special steels of high-alloy and high-carbon structure. All-State No. 252, has a tensile strength of 85,000 to 95,000 psi.

ELECTRODE HOLDER — *General Electric, Schenectady 5, N. Y.* For the fluxless welding of non-ferrous metals in the thinner gages from No. 16 to No. 40, this miniature inert-arc electrode holder has a flexible front-end assembly.

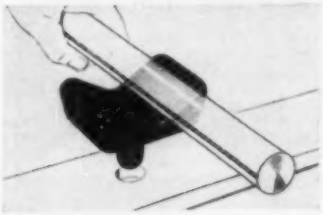
ELECTRODE HOLDER—*P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis 6, Ind.* Leakproof, water-cooled welding-electrode holder is said to eliminate the problem of drops of water which cause rust or discoloration of the material being processed.

WELDER CONTACTOR — *Square D Co., Industrial Controller Div., Milwaukee 12, Wis.* The Square D Size OW 50-amp welder contactor is for high-speed operation on small spot-welding machines up to 10 kva, 220 volts, or 20 kva at 440 volts.

WELDING ELECTRODE—*The North American Philips Co. Inc., 100 E. 42nd St., New York 17, N. Y.* Touchwelding is possible in all positions with the Norelco manual arc-welding electrodes. The contact electrode can be used with ac or dc reversed or straight polarity.

ELECTRODE—*All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.* No. 299 ac-dc electrode is especially recommended for welding of vanadium-moly spring steels, nickel-clad steels, medium-carbon steels, and air-hardenable steels. It is said to combine good resistance to corrosion with tensile strength of 110,000 to 120,000 psi.

INSULATING MATERIAL—*Bernard Welding Equipment Co., 741 E. 71st St., Chicago 19, Ill.* Lifeguard insulation material covers the electrode gripping head of the Bernard Short stub electrode holders. Holders permit deposit of total fluxed lengths of electrodes.



ANODE-ROD SUPPORT—*Automotive Rubber Co. Inc., 8601 Epworth Blvd., Detroit 4, Mich.* Self-aligning unbreakable anode-rod support is made of non-ferrous metal covered with tough semi-hard rubber. The pin of the support sets in a hole provided in the tank flange.

MAGNETIC GROUND CLAMP — *Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 14, Wis.* The Magna Ground permanent Alnico magnet is a clamp for the ground cable of electric welders, and is capable of handling 600 amps.

ANODE BAGS—*Enthone, Inc., 442 Elm St., Dept. AM, New Haven, Conn.* Nylon anode bags cover nickel, copper, silver, zinc, and other metal anodes used in electroplating solutions.

WELDING ROD—*Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.* Internally fluxed copper gas-welding rod for welding deoxidized copper prevents repeated rod oxidation and hence faulty weld metal.

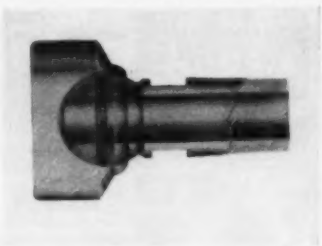
ELECTRODE CORE WIRE — *The Champion Rivet Co., Harvard Ave. and East 108th St., Cleveland 5, Ohio.* Chromoloy arc-welding electrodes have mild-steel core wires coated with chromium-molybdenum alloy which will deposit high-tensile metal in high-tensile steels.

WELD ECONOMIZER — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Eutec-Aluminum-Weld economizer is for torch welding of aluminum at temperatures far below melting point of aluminum.

WELDING—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Joining of thin aluminum is possible with a low-heat aluminum welding alloy, Eutecrod 900X.

WELDING HELMET—*Welders' Products, Dept. 92, 141 W. Jackson Blvd., Chicago 4, Ill.* A welding helmet has a movable blinker-lens permitting the welder to lower and raise the filter lens without raising his helmet by a simple downward or upward movement of his chin against a pivoted chin strap.

ZINC-BASE ROD — *All-State Welding Alloys Co., Inc., White Plains, N. Y.* Latest packaged All-State product is the No. 53 zinc-base die-cast rod, available in a 1-lb tube.



ELECTRODE—*P. R. Mallory & Co., Inc., Indianapolis, Ind.* Improved swivel-type resistance-welding electrodes have water hole drilled completely through the shank.

ELECTRODE—*Hobart Brothers Co., Hobart Square, Troy, Ohio.* Hobart No. 313 electrode makes short intermittent welds at high speed on all gages of steel in any position using ac or dc straight or reverse polarity.

ELECTRODE — *Hobart Bros. Co., Troy, Ohio.* Electrode makes high-speed tack welds on heavy weldments. It eliminates breaking excess coating from end of electrode each time the arc is started.

ELECTRODE—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* The Eutec-Hand-Omatic no-gap electrode is pressed against the metal and drawn along like a pencil. It is said that a perfect weld results automatically.

ELECTRODE—*The Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* EutecTrode, 24/49, is a 5/32-in. electrode which welds cast iron readily at 80 to 100 amp. It applies on either ac or dc with either straight or reverse polarity.

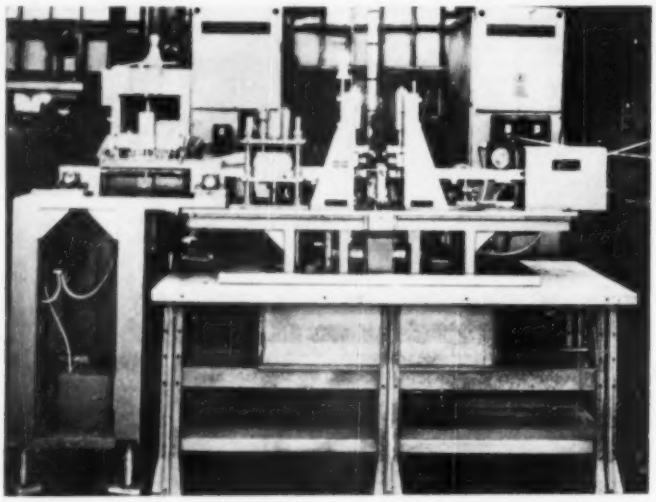
WELDING PACKAGE — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Use of a new package containing a quantity of Eutec-Die Cast-Weld with a jar of Eutector Flux solves the problem of repairing zinc die castings.

ELECTRODE — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Eutectrode 24/49 ranges ¼ in., and is introduced to meet the need for a larger-size-diameter electrode for cast-iron heavy castings.

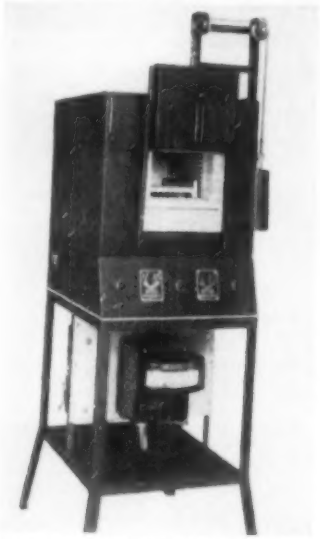
FLUXES—*Victor Equipment Co., Welding Equipment Div., 844-54 Folsom St., San Francisco 7, Calif.* Victor No. 3 flux is for brazing brass and bronze, steel, clean cast, and malleable iron. Three other fluxes are offered for special purposes.

BRAZING UNIT—*Selas Corp. of America, Erie Ave., and D Street, Philadelphia 34, Pa.* Ventilated ribs are attached to tapered steel tubes with thirteen simultaneous silver-alloy brazings on each by an automatic gas-fired machine. Forty brazed and visually straight tubes are delivered per hr.

NON-CORROSIVE FLUX—*British Industries Corp., 315 Broadway, New York, N. Y.* The non-corrosive Ersin flux is in liquid form, and is a high-grade homogenously activated water-white rosin, said to produce vigorous fluxing action.

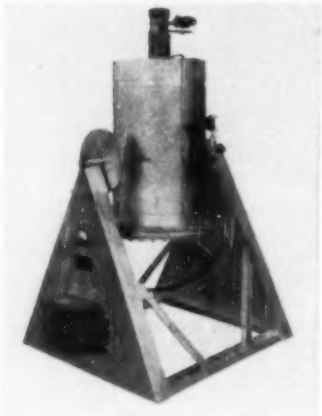


SCANNER — *Westinghouse Electric Corp., Pittsburgh 30, Pa.* Horizontal rotating scanner is for the induction hardening of shafts and pins. The automatic machine requires manual refilling of magazine at 8-min intervals.



ELECTRIC FURNACE—*K. H. Huppert Co., 6830 Cottage Grove Ave., Chicago 37, Ill.* Heat control over the range from room temperature to 2000 F is provided in the No. 11 FM special electric furnace. Temperature is governed automatically.

HARDENING MACHINE — *Selas Corp. of America, Erie Ave., and D St., Philadelphia 34, Pa.* Loading arm of automatic radiant gas hardening machine places pieces on the rotary refractory hearth which moves past a series of 24 radiant ceramic gas burners, advancing the pieces at the required temperature and time.



ELECTRIC FURNACE — *Pereny Equipment Co., 893 Chambers Road, Columbus 12, Ohio.* High-temperature operation up to 3500 F under a neutral or reducing atmosphere is featured with this electric furnace.

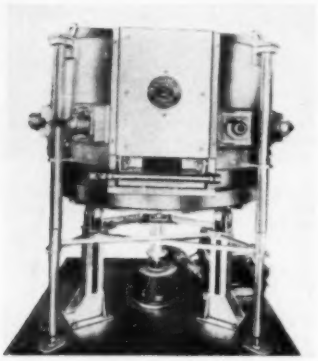
BLOWERS — *Lindberg Engineering Co., Air and Hydraulic Div., 2444 West Hubbard St., Chicago 12, Ill.* An improved line of single-stage centrifugal blowers feature full 360° positioning of the air outlet.

FURNACES ATMOSPHERE GENERATOR — *The Lithium Co., 111 Sylvan Ave., Newark 4, N. J.* Attached to any direct oil- or gas-fired batch or continuous furnace, this generator produces an atmosphere which prevents scale formation in soaking, normalizing, annealing, malleabilizing, or hardening operations.

MUFFLE FURNACES—*Cooley Electric Mfg. Corp., 38 S. Shelby St., Indianapolis 7, Ind.* Laboratory muffle furnaces with integral selective power modifiers are designed for a complete temperature range from 300 to 2000 F.

OIL BURNER CONTROL — *Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.* Protection of oil burners from the dangers of flame failure and automatic programming for these burners is offered in a new control instrument. Set includes photoelectric scanner and a programming control.

FLAME-HARDENING MACHINE — *The Stearns-Roger Mfg. Co., Denver 2, Colo.* Industrial flame-hardening on a production level is obtained in a universal flame-hardening machine. Case depth can be precisely controlled up to ½ in. without disturbing basic structure of core material.



FORGE FURNACE—*W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.* With working hearth of 4 ft dia, Rockwell forge furnace is capable of producing up to 900 lb of forgings per hr heated to 2100 F.

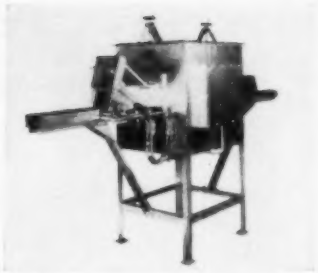
FURNACES—*Cooley Electric Mfg. Corp., 38 South Shelby St., Indianapolis, Ind.* A series of industrial box furnaces embodies resistors embedded in ceramic slabs. In the side wall they are so placed that an air space is left behind, above, and below the slab which then forms a baffle wall creating a natural convection when heated.

GEAR-HARDENING MACHINE—*The Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.* Automatic gear-hardening machine has a heating, quenching, and indexing unit for hardening of gear teeth, one tooth at a time, by induction heating.

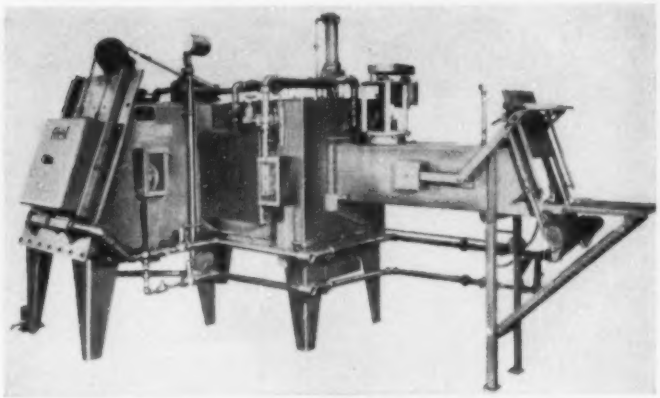
BURNER—*North American Mfg. Co., 4455 E. 71st St., Cleveland 5, Ohio.* A combination gas-oil burner known as the Series 225 Dual-Fuel burner is for applications such as heat-treating, forging and smelting.

SALT BATH — *American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.* Aeroheat 1190 is a neutral salt bath recommended for the heat treatment of medium- and high-carbon steels without decarburization under severe operating conditions.

LABORATORY FURNACE — *Pereny Equipment Co., 893 Chambers Road, Columbus 12, Ohio.* Pereco CB-55 electric laboratory and shop furnace has 12x8¾x6-in. work chambers. Normal operation is a 2500 F. Up to 3000 F is permissible for occasional flash firings.



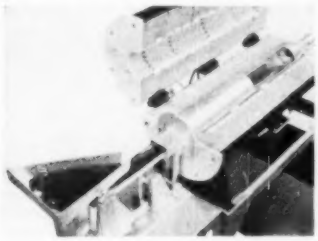
ELECTRIC FURNACE — *Pereny Equipment Co., 893 Chambers Road, Columbus 12, Ohio.* Model SNX electric furnace is designed for sintering powdered metals, brazing, and bright annealing. Normal heat range is 1400 to 2500 F—flash firing, to 2750 F.



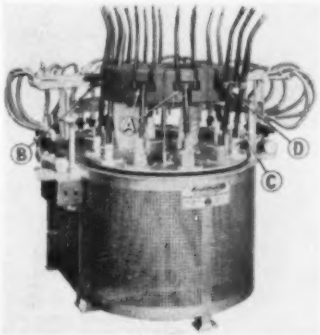
FURNACE — *Lindberg Engineering Co., 2444 West Hubbard St., Chicago 12, Ill.* The Lindberg L high-speed steel furnace was developed to harden precision high-speed tools with fine cutting edges that cannot be ground or cleaned after hardening. This one unit combines preheat, high heat, and quench operations.

FURNACE—*Selas Corp. of America, Erie Ave. and D Street, Philadelphia 34, Pa.* Multiple strands of wire are being tinned continuously in pots heated by radiant ceramic gas burners in furnaces.

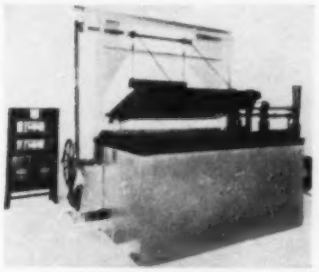
MUFFLE FURNACES — *Hevi-Duty Electric Co., Milwaukee 1, Wis.* Muffle furnaces designed primarily for general-laboratory requirements such as drying of precipitates are housed in cylindrical shells mounted on pyramid bases.



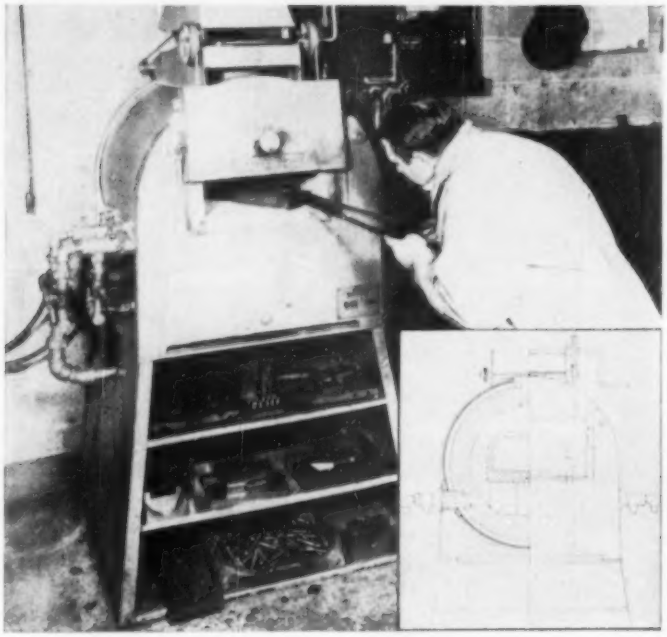
SHAKER-HEARTH FURNACE — *Hevi Duty Electric Co., Milwaukee 1, Wis.* There are no bearings, moving hangers, or other conveyor parts in the heating chamber of the Hevi Duty furnace, thus eliminating maintenance and heat loss due to trays, chains, or belts.



HEAT TREATER—*Selas Corp. of America, Erie Ave. and D Street, Philadelphia 34, Pa.* Automatic radiant gas-burning machines give fork assemblies total heat exposure of 12 sec at 1750 F. Posts supporting the assemblies during the six-station brazing cycle can be adjusted quickly to part size.



SALT BATH — *James H. Knapp Co., 859 East Fourth St., Los Angeles 13, Calif.* Portable I-beam-based salt bath for descaling stainless-steel parts is heated by two immersion tubes equipped with air-operated eductors to around 930 F.



FURNACE—*Sunbeam Stewart Industrial Furnace Div., of Sunbeam Corp., 4455 Ogden Ave., Chicago 23, Ill.* Inverted muffle section in this wide-range oven makes the unit quickly convertible from semi-muffle to full-muffle for atmospheric hardening. Unit operates over a 300 to 2400 F temperature range.

HEATING UNIT—*Lindberg Engineering Co., High Frequency Heating Div., 2444 West Hubbard St., Chicago 12, Ill.* For operation on 230-, 460-, and 550-volt, 3-phase, 60-cycle power, the LI-25 induction-heating unit is a high-frequency vacuum-tube converter, suitable for heating metal and other electrical conducting materials.

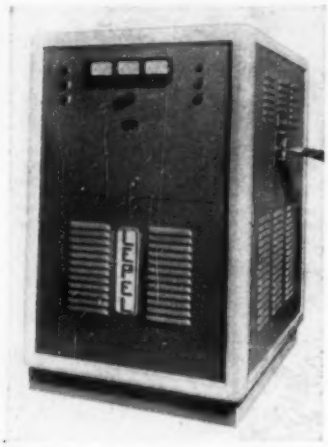
QUENCHING UNIT — *Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York City 23, N. Y.* The P-60 progressive-feed unit is for fast surface hardening of shafts, bars, leadscrews, and fabricated parts up to 5-ft length and 3-in. OD.

WIRE ANNEALER—*Synchro Machine Co., 611 Sayre Ave., Perth Amboy, N. J.* Wire annealer comprises the application of resistance heating to non-ferrous wire in its continuous passage from the wire-drawing machine to the reeler or take-up.

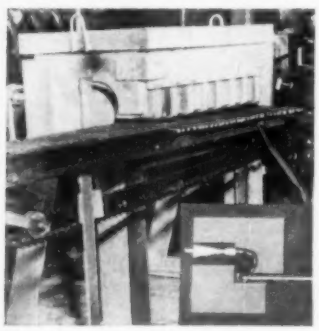
HEAT EXCHANGERS — *Industrial Filter & Pump Mfg. Co., 1621-39 West Carroll Avenue, Chicago 12, Illinois.* Design and construction of heat exchangers permit use of same unit for both heating and cooling electroplating solutions as operating conditions require.

FURNACE RETORT — *Stanwood Corp., Chicago 39, Ill.* Nickel-chrome alloys are used throughout the Stanwood retort. This unit features a one-piece bottom seal ring.

ELECTRIC FURNACE — *Thermo Electric Mfg. Co., 461 W. Locust St., Dubuque, Iowa.* Designed for operation on 115 and 230 volts, the Series 1500 Temco electric bench furnace can operate continuously from 350 to 1600 F and intermittently to 1900 F.



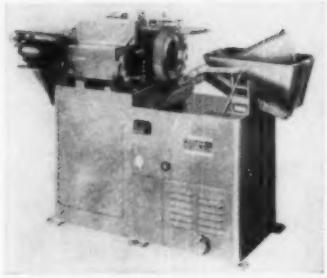
HEATING UNIT—*Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York, N. Y.* Vacuum-tube high-frequency heating unit is for non-ferrous as well as ferrous materials at any desired temperature.



END HEATING FURNACE — *Gas Appliance Service Inc., 1211 Webster Ave., Chicago, Ill.* Operating at high manifold pressures and burning any commercially available gas, the Roto-Flame furnace is used for forging, swaging, upsetting, threading, hardening, and annealing.

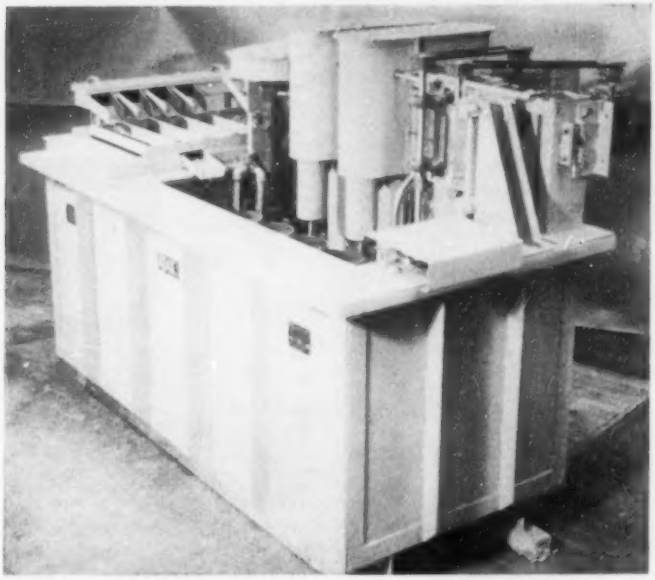
HEAT LAMPS — *Amplex Corp., 111 Water St., Brooklyn, N. Y.* Hermetically sealed and protected from dirt, dust, and fumes, 500-watt sealbeam industrial heat lamps incorporate tungsten filaments, pre-tested for twist and sag.

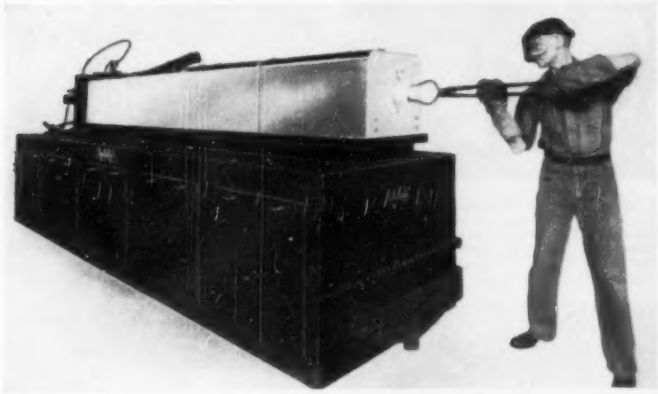
INDUCTION-MELTING FURNACE—*Lindberg Engineering Co., 2444 West Hubbard St., Chicago 12, Ill.* Channel flushing is a new development in induction-melting furnaces which keeps the channels between the two chambers clean and free of slag or oxide accumulation.



SLUG-HEATING MACHINE—*Feedall Machine and Engineering Co., 70 Vine St., Willoughby, Ohio.* Automatic slug-heating machine is used with an induction heating unit. The machine was tooled for heating slugs of 1-in. dia, 1 in. long at the rate of approximately 20 per min.

HEAT EXCHANGER—*Carlso'n Inc, Griswold St. Ext., P. O. Box 846, Warren, Ohio.* The Carlso'n heat exchanger, Mark I, Model I, is applicable to resistance welding installations and eliminates scaling and corrosion in the water passages, lengthening the life of electrodes by proper cooling.





INDUCTION HEATER—*Ajax Electrothermic Corp., Trenton 5, N. J.* The Ajax Northrup heater delivers a 2½x 3 15/16-in. steel blank every 4.8 sec to the mouth of the forging machine—every blank at a closely controlled 2200 F.

TILTING FURNACES—*Bellevue Industrial Furnace Co., 2971 Bellevue Ave., Detroit, Mich.* Self-contained units fired with oil or gas, these Sklenar-type furnaces are for melting ferrous and non-ferrous metals and alloys. They range in capacity from 350 to 20,000 lb. Continuous charging is practical and can be used for melting metal in almost any form as well as ingots.

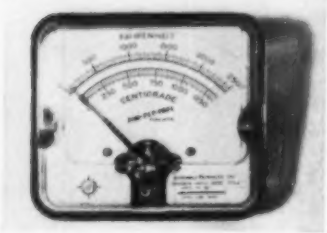
ROTARY FURNACE — *Holcroft & Co., 6545 Epworth Blvd., Detroit 10, Mich.* Requiring only one operator, this rotary furnace can be used for carburizing, carbonitriding, and clean hardening.

FORGE FURNACE — *Eclipse Fuel Engineering Co., Rockford, Ill.* Engineered for heavy-duty and continuous operation at 2200 F, Eclipse furnaces are equipped with McKee Zero governors which give automatic control of the air-gas ratio throughout the entire range of the burner.

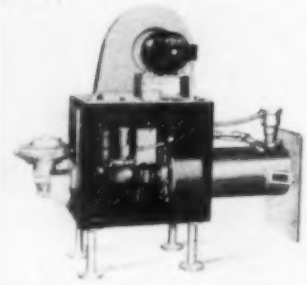
FURNACE—*Ajax Electric Co., Inc., Frankford Ave., Philadelphia 23, Pa.* Isothermal quench furnace provides rapid and uniform cooling of work and a method of extracting the high-temperature chloride salts carried over from the austenitizing bath.

INDUCTION HEATER—*Sherman Industrial Electronics Co., 505 Washington Ave., Belleville 9, N. J.* Ultra-fast 2-kw induction heater allows operator to hold work in hand in complete safety.

ELECTRIC FURNACES—*Thermo Electric Mfg. Co., 461 West Locust St., Dubuque, Iowa.* Employing Series 1700 Temco electric furnaces, permit access to the heating chamber with minimum loss of heat. Heavily insulated door is divided into two sections.



PYROMETER INDICATOR—*Assembly Products, Inc., Main and Bell Streets, Chagrin Falls, Ohio.* The Simplytrol indicating pyrometers have dials calibrated in both Fahrenheit and Centigrade. Scales are over 3 in. long.



FIRING UNIT—*Eclipse Fuel Engineering Co., 764 S. Main St., Rockford, Ill.* Eclipse Gas Pak combustion assembly is for automatic firing of different types of heating equipment. The packaged unit comprises the blower, burner, mixer, safety equipment, valves, regulator, piping, and wiring.

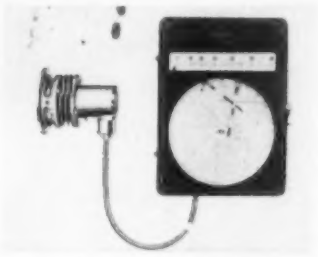
PYROMETER — *The Pyrometer Instrument Co. Inc., Bergenfield, N. J.* Providing a 4-in. direct-reading indicator, mounted in a rubber-cushioned housing the Pyro surface pyrometer determines surface and subsurface temperatures.

INDICATING CONTROLLER — *Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.* Indicating controller measures and controls process variables such as temperature, voltage, amperage, pressure, and speed.

TEMPERATURE CONTROL—*Claud S. Gordon Co., 3000 South Wallace St., Chicago 1, Ill.* Unit is used with any standard make of pyrometer controller for unusually close temperature-variation control.

PELLETS—*Tempil Corp., 132 West 22nd St., New York 11, N. Y.* Additional high-temperature ratings of Tempilstiks and Tempil pellets cover the range between 1600 and 2000 F.

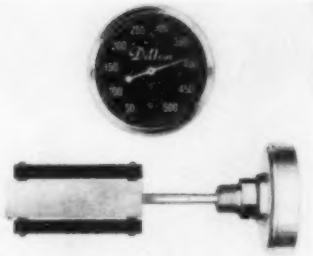
FLAME-FAILURE SAFEGUARD—*Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.* Photoelectric flame-failure safeguard for oil flames supervises both pilot gas flames and the main oil flame of automatic oil burners.



PYROMETER — *The Bristol Co., Waterbury 20, Conn.* The Pyroviser is for indicating, recording, and controlling temperatures up to 4000° F in furnaces and kilns. The unit is said to produce 99% response to temperature change within one second.

THERMOCOUPLE—*Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.* Xactemp thermocouple indicator is for general non-critical use. It is calibrated for either Iron-Constantan or Chromel-Alumel thermocouples.

TIME-TEMPERATURE CONTROLLER—*Taco West Corp., 514 N. Noble St., Chicago 22, Ill. Dept. W.* Controlling temperature by predetermined schedules is done with the Model CPR time-temperature program controller. Instrument is 9x18x8 in. deep and is designed for flush or surface mounting.

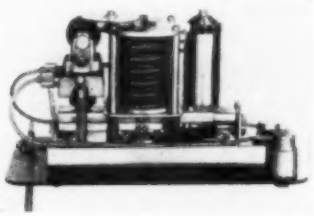


THERMOMETER — *W. C. Dillon & Co. Inc., 5401 W. Harrison St., Chicago 44, Ill.* Capable of withstanding more than 3476 psi the Dillon Flag Stem magnetic thermometer is for application on such items as electric flatirons, griddles, transformers, engine blocks, air ducts, and exhaust ports.

TEMPERATURE INDICATORS — *Tempil Corp., 132 W. 22nd St., New York 11, N. Y.* Tempilsticks (crayon), Tempilaq (liquid), and Tempil Pellets are available in 12½° intervals for intermediate temperatures ranging from 113 F to 450 F and from 450 to 1600 F.

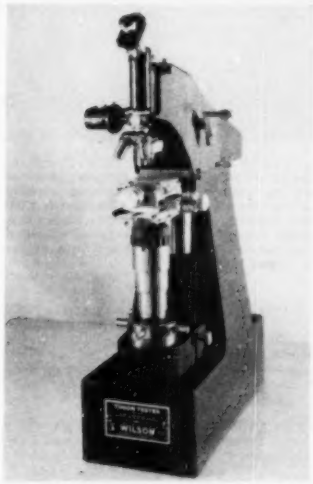
COMBUSTION SAFEGUARD — *The Wheelco Instrument Co., 847 W. Harrison St., Chicago, Ill.* Flame-otrol, for industrial or commercial heating equipment, detects the presence or absence of a gas or oil flame of any type of burner instantaneously.

FLAME-FAILURE SAFEGUARD — *Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.* The Fireye System FF-3 is offered for flame-failure protection of semi-automatic and manually ignited industrial oil burners.

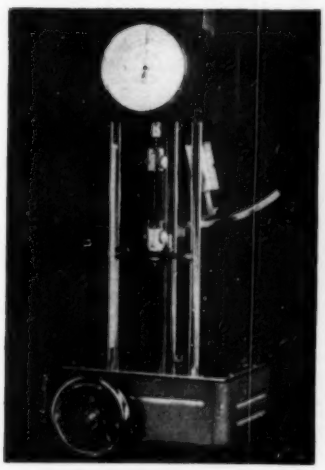


TEMPERATURE TRANSMITTER—*Taylor Instrument Companies, Rochester 1, N. Y.* Force-balance pneumatic temperature transmitter is for applications where it is desirable to have the indication, record, or control remotely located from the point of measurement and where it is necessary to have accuracy, high speed of response, small thermal elements, and short-range spans within the limits of —375 and +1000 F.

Layout and Inspection



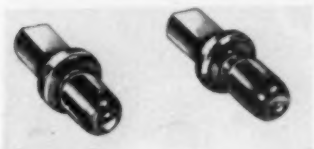
HARDNESS TESTER — *Wilson Mechanical Instrument Co., Inc., Associate Co. of the American Chain and Cable Co., Inc., Bridgeport 2, Conn.* Capable of applying loads from 1 to 1000 g, the Tukon Model MO hardness tester is mechanically operated and is adaptable to either Knoop or 136° diamond pyramid indenters.



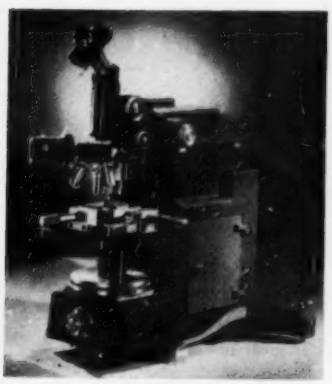
TESTER—*W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill.* Hand-operated multi-low-range universal testing machine handles specimens in tensile, compression, transverse, and shear. Calibrations can be in tenths of a pound, ounces, or kilograms.

HARDNESS TESTER — *Wilson Mechanical Instrument Co., Inc., 230 Park Ave., New York 17, N. Y.* Model MO Tukon microhardness tester is mechanically operated and recommended for light-load testing where there is not sufficient testing to warrant an automatic model.

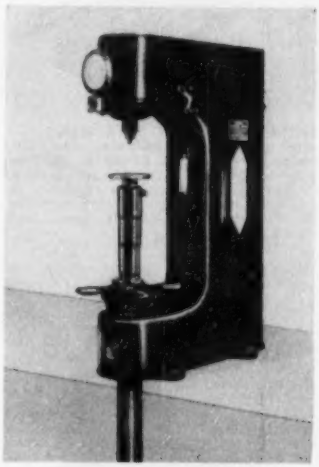
HARDNESS TESTER — *Barber-Colman Co., Rockford, Ill.* The Impressor is designed for use in any position for testing hardness of fabricated plastic or non-ferrous metal parts.



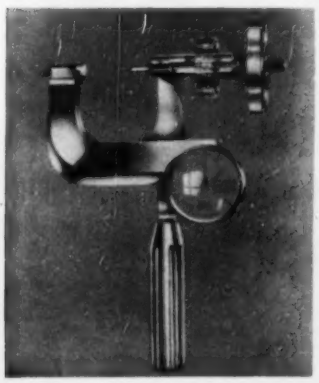
PENETRATORS—*Clark Instruments Inc., 10200 Ford Road, Dearborn, Mich.* Ball penetrators are available in 1/16, ¼, ¼ and ½ in. sizes, and can be used in all makes of Rockwell testing machines.



HARDNESS TESTER—*The Kent Cliff Laboratories, Peekskill, N. Y.* Kentron Micro-hardness tester applies accurately dead-weight loads as light as 1 g for use with either the Knoop indenter or the Vickers-type indenter. Dead weights for applying loads of 1 to 1000 g are supplied.



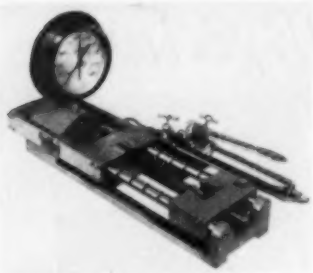
HARDNESS TESTER—*Clark Instrument, Inc., 10200 Ford Road, Dearborn, Mich.* Clark hardness testers, Models C-8A, C-12A and C-16A, feature a spindle housing and beam assembly that can be replaced by the owner himself without requiring special skill or special tools.



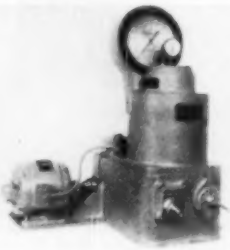
HARDNESS TESTER—*Ames Precision Machine Works, Waltham 54, Mass.* Model 2 hardness tester weighs 2½ lb and can be used to test dies, knives, odd-shaped parts, and similar materials to 2 in. Tests are made directly in the Rockwell scales.

HARDNESS TESTER—*Richle Testing Machines Div., American Machine and Metals Inc., East Moline, Ill.* Portable hardness tester for Rockwell readings weighs 3 lb 6 oz. It is said to be comparable in accuracy to bench-type testers.

LAYOUT and INSPECTION



TENSILE-TESTING MACHINE — *Steel City Testing Machine, Inc., Detroit, Mich.* Model PO-40 is particularly adaptable for on-the-job testing of welds. The machine's capacity is 40,000 lb on specimens with a 6- to 13-in. length, up to ⅝-in. thickness and 2¼-in. width.



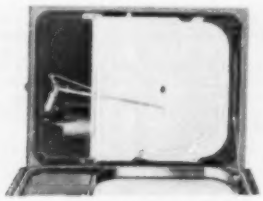
DUCTILITY TESTING MACHINE—*Steel City Testing Machines Inc., 8843 Livernois Ave., Detroit 4, Mich.* A bench-model ductility testing machine tests the drawing qualities of sheet metal. It is 2 ft 11 in. in height and 26 in. across and has a capacity of 15,000 lb to cup test material up to ⅛ in. in thickness, or 30,000 lb for material up to ¼ in. in thickness.

MEASURING MACHINE — *George Scherr Co., 200 Lafayette St., New York 12, N. Y.* This measuring machine for external and internal measurements is adaptable for use as a master check and for determining accurate dimensions on pin gages, standard bars and end measuring rods.

GAGE—*The Sheffield Corp., Dayton 1, Ohio.* Automatic "airlectric gaging, classifying, and segregating machine gages connecting rods for all critical dimensions and conditions, stamps them with proper classification, and segregates them at a rate of one every five seconds.

GAGING MACHINE — *The Sheffield Corp., Dayton 1, Ohio.* Cylinder-block gaging machine accurately checks each of the bores in V-8 motor blocks at four different points. The operator manually stamps the classification for proper assembly.

CHECKING MACHINE — *Sheffield Corp. of Dayton, Ohio.* Sheffield automatic valve tappet gaging and segregating machine checks all critical dimensions of an automotive valve tappet and properly segregates the acceptable, rejected, and salvageable parts. The machine has a capacity of 2000 parts per hr.



PRESSURE GAGE—*The Bristol Co., Waterbury 91, Conn.* Employing a frictionless pressure-sealed lever arm, entirely free from lost motion and turning moments due to changes in differential pressure, the Series 500 pressure gage records extremely low absolute pressure ranges.

PISTON GAGE — *Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford, Conn.* Nine critical dimensions of an automotive piston are checked simultaneously on this specially designed multiple-station piston gage.

PISTON GAGE — *Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.* A multiple-station piston gage checks six dimensions simultaneously, stamps two grades, and automatically shows the number of pistons of each grade inspected.

CALIPER—*Glogau & Co., Inc., Dept. O, 1910 W. Birchwood Ave., Chicago 26, Ill.* Precision calipers imported from Germany are again available to American craftsmen. The Glogau vernier caliper No. 12 is made of hardened German steel and is nickel-plated.

SMALL-HOLE GAGES, PIN VISES—*The Lufkin Rule Co., Saginaw, Mich.* Small-hole gages measure diameters of holes or the width of slots or grooves below the 5/16-in. range. Vises are also offered for holding small stock to be worked, taps, drills, scribers, and small files.

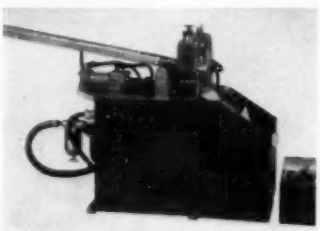
AUTOMATIC CLASSIFIER—*Sheffield Corp., Dayton 1, Ohio.* Automatic classifying of refrigerating-unit muffle boxes into 21 divisions is performed by this Airlectric machine. It checks average diameter of the counterbore and classifies it in one of three tolerances of 0.0003 in.

CRANKSHAFT GAGE—*The Sheffield Corp., Dayton 1, Ohio.* This unit has 20 Precisionaire tubes. Each main bearing is checked at three points. Two jets check seal diameter and width of rear main bearing.

PRECISIONAIRE GAGE — *Sheffield Corp., Dayton 1, Ohio.* Spider-type Precisionaire spindle eliminates difficulties of cocking and sticking often encountered in checking shallow large-diameter holes.

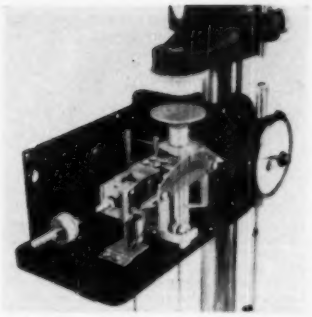
CHECKING INSTRUMENT — *The Sheffield Corp., Dayton, Ohio.* The Multicheck machine simultaneously checks eleven critical dimensions and determines one of five skirt-diameter classifications of diesel pistons.

DIAL PRECISIONAIRES—*The Sheffield Corp., Dayton 1, Ohio.* Blade-contact air spindles facilitate instrument checks on practically any hole regardless of finish, interruptions, or size.

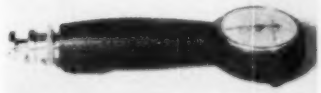


GAGING UNITS — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Capable of segregating a product into any number of categories, each of any dimensional widths, the Brown & Sharpe special-automatic and semi-automatic inspecting and sorting equipment can be made to meet individual needs for volume of product.

HEIGHT GAGE—*Metal Items, 820 Sixth Street, Racine, Wis.* A micrometer height gage, the Mikro Marker, can be used for layout and for gaging applications. Reading range is from 0 to 1 in. by thousandths.

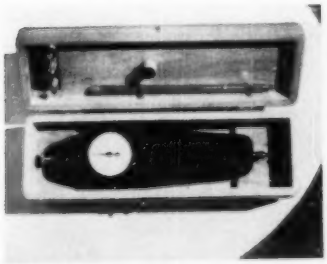


SPRING TESTER—*The Baldwin Locomotive Works, Philadelphia 2, Pa.* Testing of any type of small spring (coil, flat, special design, or spring assembly) within the limits of 12-in. length and 5-lb load can be accomplished with the Baldwin Hunter spring tester.



TAPER COMPARATOR—*Dow Mechanical Corp., Thompsonville, Conn.* The Tacomp is a taper comparator that will check 800 taper holes per hr to an accuracy of one minute. It uses two contact lines on the taper.

DIVIDING HEAD—*The R. Y. Ferner Co., 110 Pleasant St., Boston 48, Mass.* Accuracy of dividing of the Cooke optical dividing head is said to be 10 sec of the arc. This is made possible by use of the high-powered microscope contained in the head.

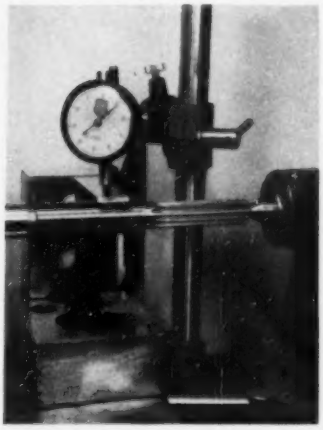


FORCE INDICATOR—*Hunter Spring Co., Lansdale, Pa.* Force indicator utilizes a precision-compensator spring system to give force measurements accurate to ½ graduation or ½ of 1% at full scale of the dial indicator.

THREAD-RING GAGES — *Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Go and not-go carbide Dualock adjustable thread-ring gages are said to eliminate the hazard of gage wear on close-tolerance work.

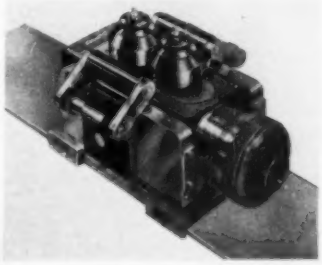
PLUG GAGES—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Plug gages have reversible gaging members. When a member has worn below size, it can be replaced with the other end.

PLUMB—*Wm. B. Fell Co., 330 McLain Ave., Rockford, Ill.* Two Fell precision-level glasses are used in this tool; one for horizontal leveling and one for vertical or plumb. Glasses are graduated in 0.0005-in. per ft spaces both ways.



PITCH-DIAMETER GAGE — *The Cross Co., Detroit, Mich.* Standard gages checks the concentricity of a ground thread on a tapping spindle.

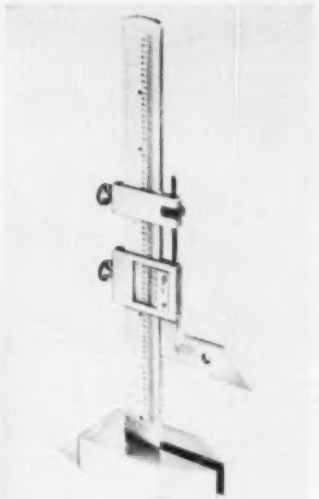
SNAP GAGE—*Nillson Gage Co., Inc., Poughkeepsie, N. Y.* The Nilco dial snap gage is equipped with upper and lower radius guides attached to the frame. Guides permit close check, detecting any hour-glass condition for oversize fillet.



WIDTH GAGE — *Pratt & Whitney, Div. of Niles-Bement-Pond Co., West Hartford 1, Conn.* The P & W Model B magnetic continuous width gage indicates the diameter or width of continuous rolls of wire or thin-strip materials while they are being processed.

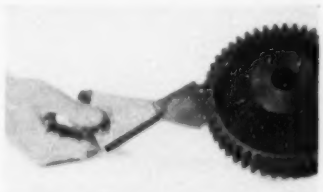
PLUG GAGES—*The Taft-Peirce Mfg. Co., Woonsocket, R. I.* Reversible cylindrical plug gages have positive locking action so that the plug cannot slip. The plug gages (AGD standard) are available in sizes from 0.025 in. to 0.510 in. both go and not-go.

FLEXIBLE RULES—*Stanley Tools, New Britain, Conn.* The Pull-push rules No. 346 and 348 feature die-cast D-shaped cases, triple plated—chrome over nickel over copper. They are available in 6- and 8-ft lengths.



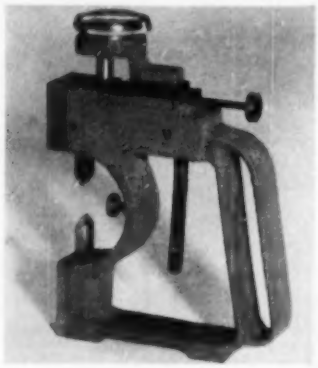
HEIGHT GAGE—*Vurd, Inc., 2981 E. Colorado St., Pasadena 8, Calif.* Vernier height gage has a slotted base which makes possible direct readings from 0 to 6 in., eliminating the necessity for computations.

POWER-GAGING HANDLE — *The Taft-Peirce Mfg. Co., Woonsocket, R. I.* Power-driven gaging handle is for inspection of internally threaded parts. Manual rotation of a gage is eliminated.



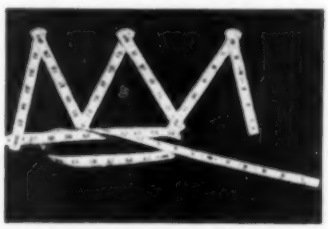
GEAR GAGE—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Gear gage for shop use can be carried in a toolbox or in the pocket. The shop-model gage has 16 blades.

LAYOUT and INSPECTION



INDICATOR GAGE — *MP Tool and Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* The MP PD-Matic, equipped with basic rack teeth and dial indicator, is for fast, simple, and accurate checking of gear and spline, sizes, and tapers.

SNAP GAGE — *Federal Products Corp., 1144 Eddy St., Providence 1, R. I.* The Federal Model 1000 dial-indicator snap gage is offered in five sizes covering all dimensions from 0 to 6 in. The dial indicator has cushion movement and can be faced in any position for machine or bench use.

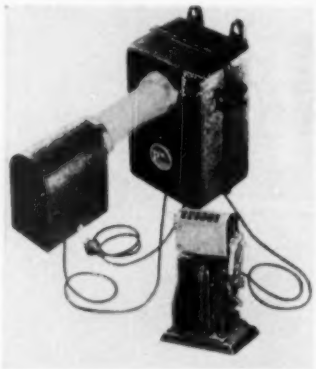


STEEL RULE—*Durall Tool Corp., 117 Woodworth Ave., Yonkers, N. Y.* Bright white enameled 6-ft zigzag folding rule is made of special hardened and tempered alloy steel and can be bent and twisted.

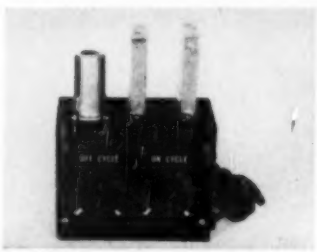
COUNTER—*Durant Mfg. Co., 1929 N. Buffum St., Milwaukee 1, Wis.* Inclosed in a streamlined, one-piece die-cast case, this top-reading rotary counter is available in both reset and non-reset models.

TIME-IN-PROCESS RECORDER — *Bristol Co., Waterbury 91, Conn.* Instrument gives a reading on a uniform scale and chart of rate of conveyor movement, directly in terms of the total time consumed by work in traveling through a process.

ELECTRONIC COUNTER DECADES—*Potter Instrument Co. Inc., 136-56 Roosevelt Ave., Flushing, N. Y.* High-speed electronic counter decades used in the Potter standard counters, scalers, predetermined counters, and counter chronographs are available separately.

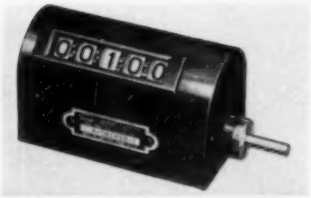


PHOTOELECTRIC COUNTER—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* The Photoswitch counter set P-1 can tally up to 600 counts per min and allows 6-ft space between photoelectric units and light source.

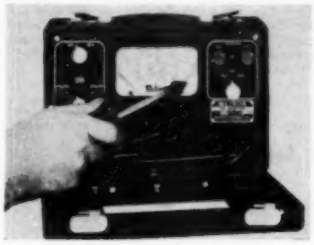


ELECTRONIC CYCLO-TIMER—*G. C. Wilson & Co., 2 N. Passaic Ave., Chatham, N. J.* The Cyclo-Flex timer may be operated either single interval with manual initiation, or as a repeat-cycle timer with two adjustable intervals which occur successively without any external operation.

MAGNETIC COUNTER—*Veeder-Root, Inc., Hartford 2, Conn.* The Model 1248 magnetic reset counter is capable of 1000 counts per min.

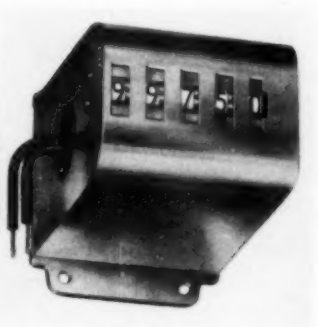


COUNTER—*Veeder-Root Inc., Hartford, Conn.* Counter can be supplied as a revolutionary ratchet unit, adding one count per revolution of the drive shaft in either direction, or as a ratchet with stop counter (made to order only), adding one count for each oscillation of the lever through an angle of 30°.



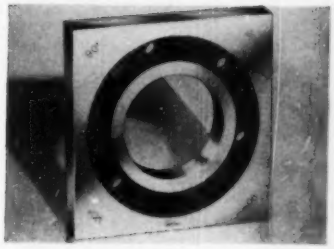
TACHOMETER — *Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Type 48K precision tachometer is suited for motor and generator testing. Total speed range without adapters is 360 to 4000 rpm, accommodating all synchronous or induction motors and most geared motors.

PORTABLE TIMER — *Wil-Mar Co., Box 1, Natick, Mass.* Portable 60-min ac timer offered in plastic case with dial and plastic indicating knob, can fit comfortably into one hand.

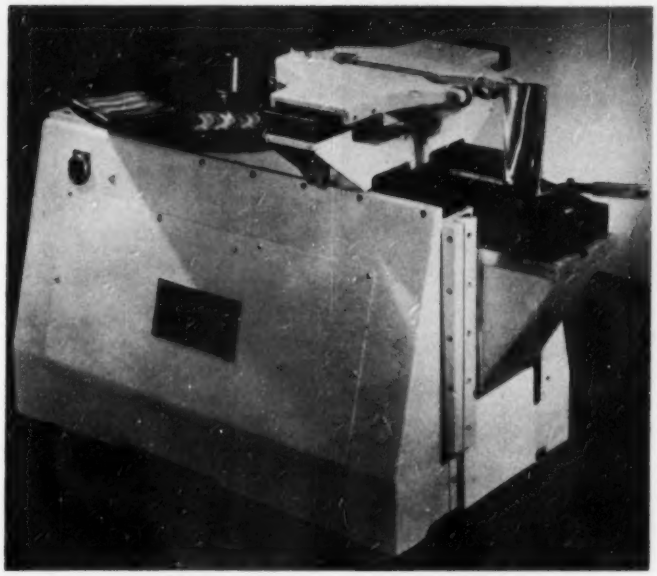


COUNTER—*Veeder-Root Inc., Hartford, Conn.* Magnetic counter is designed for installations which do not require an extrmely high number of accumulated counts or high speeds.

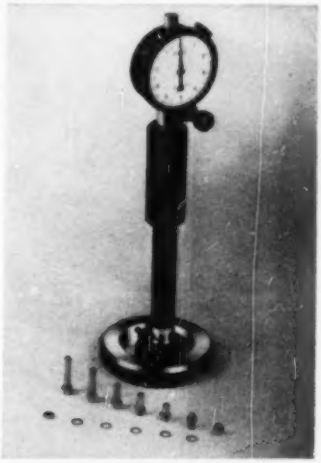
INTERVAL TIMER—*The R. W. Cramer Co., Inc., Centerbrook, Conn.* The Type IG interval timer is for use when electrical equipment is to be manually turned on, run for a preset time, and stopped automatically.



TRUE SQUARE—*Webber Gage Co., 12900 Triskett Road, Cleveland 11, Ohio.* The Webber True Square is designed for precision indexing. All faces are at precisely 90° to adjacent sides with perfect optical flatness and paralelism.

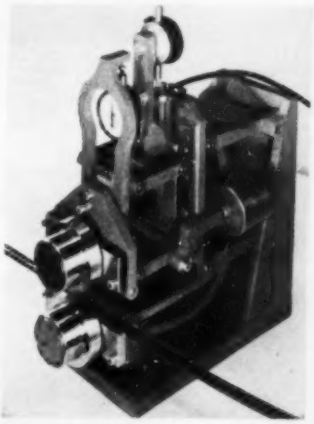


BLADE CHECKER—*Engineers Specialties Div., The Universal Engraving & Colorprint Co. Inc., 980 Ellicott St., Buffalo 8, N. Y.* The Pant-O-Scriber blade checker inspects airfoil contours of blades. Its operation was clocked at 43 sec for a three-section blade.

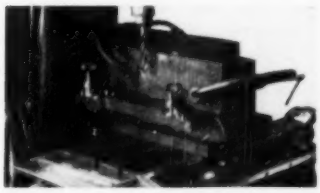


BORE GAGES—*Nilsson Gage Co., Inc., 2A Lake St., Poughkeepsie, N. Y.* Large Nilco dial bore gages are available in five sizes ranging from ⅞ to 12 in. and are standard with a tenth indicator. They can be adapted with any other type of indicator of any graduation, make, or model of the American gage design standard class.

VIBRATION INTEGRATOR — *Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.* Type 410-X6 vibration integrator and Type 410-X6 calibrated vibration pickup enable measurement of vibration displacement, velocity, and acceleration in the audio-frequency range.



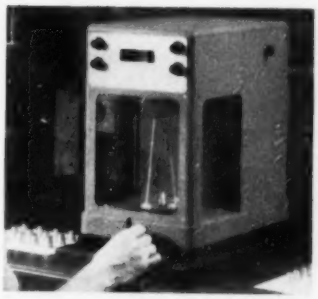
WIRE COATING GAGE — *Federal Products Corp., 1144 Eddy St., Providence, R. I.* Thickness of plastic coatings deposited on copper electrical wire is accurately and automatically controlled with this continuous measuring gage.



ANGLE PLATES—*Rahn Granite Surface Plate Co., 1149 Platt Circle, Dayton 7, Ohio.* Precision angle plates of black granite are made to a tolerance of 0.00005 in. per 12 in.

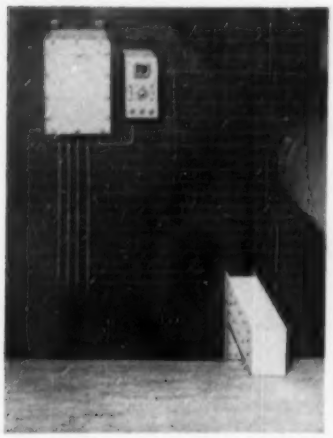
DIAMETRAL-PITCH GAGE — *American Gear & Mfg. Co., 5900 Ogden Ave., Chicago 50 Ill.* Consisting of 16 separate gages, this set covers 23 popular sizes from 4 DP through 64 DP. Each gage shows standard Brown & Sharpe tooth measurements.

THICKNESS GAGE—*Branson Instruments, Inc., 536 Fairfield Ave., Stamford, Conn.* The Coatingage is an instrument for measuring the thickness of nonmagnetic coatings on iron or steel. Two concentric scales cover a range of 0.0001 to 0.50 in.

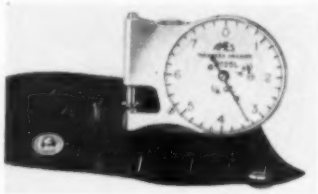


ANALYTICAL BALANCE — *Fisher Scientific Co., Pittsburgh, Pa.* Weighing small finished parts ranging from 0.0001 to 200 g, the Gram-atic Balance is accurate to 1/20 of a mg.

LAYOUT and INSPECTION

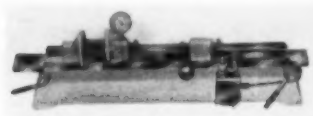


THICKNESS GAGE—*General Electric Co., Schenectady 5, N. Y.* The Beta-Ray thickness gage is to measure continuously the thickness of sheet materials moving along a conveyor without contacting or disturbing the material. It measures the amount of beta-rays which are absorbed by the sheet material being checked.



THICKNESS MEASURE—*B. C. Ames Co., Waltham 54, Mass.* Pocket-size thickness measure, calibrated in leather ounces, Model No. 25L can be carried in vest or a watch pocket.

INSPECTION LOUPE—*Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.* Intended for critical inspections requiring an undistorted, color-corrected field, this loupe has a 14-powe, cemented three-element lens system.

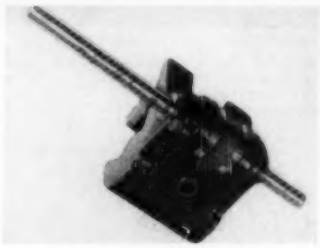


SPRING ANALYZER—*Storm-Vulcan, Inc., Dallas, Texas.* Hydraulically-operated spring analyzer measures the rate of compression springs ½ in. to 6 in. long, or tension springs 1 in. to 22 in. long; up to 3-in. diameters.

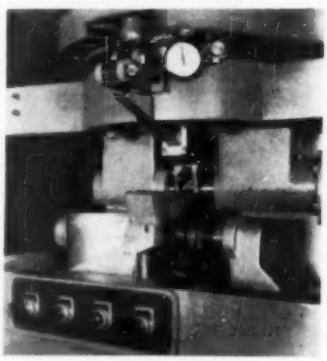
PHASE CONTRAST ACCESSORIES—*Bausch & Lomb Optical Co., Rochester 2, N. Y.* Phase Contrast Accessories for metallography consist of three parts: a basic phase contrast instrument, a centering telescope, and an annular disc.

INSPECTION UNIT — *Magnaflux Corp., 5900 Northwest Highway, Chicago 31, Ill.* The MAL-3 inspection unit automatically inspects automotive connecting rods, spindles, and similar parts at production speeds. Cracks, forgings, laps, and similar defects are indicated.

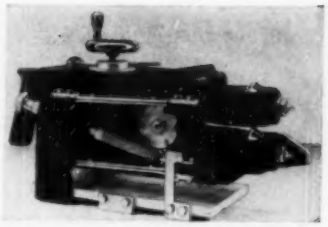
TEST BENCHES — *Fisher Scientific Co., 717 Forbest St., Pittsburgh 19, Pa.* Benches can be obtained in any length and a variety of designs by joining prefabricated steel units.



CARRIAGE SPACER—*Ellwood Products Co., 3049 E. Grand Blvd., Detroit 2, Mich.* Combined micrometer stop and lathe-carriage spacer is said to save from 3 to 10 min on every job requiring micrometer stops.

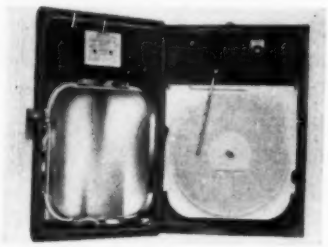


GAGING DEVICE—*The Michigan Tool Co., 7171 E. McNichols Road, Detroit, Mich.* Semi-automatic gaging device, which is mounted at the loading end of the chute leading into the machine, consists of two gears used to gage the pinions being finished. The gears are mounted so they can revolve freely.



LIMIT GAGE—*Pratt & Whitney, Div. of Niles-Bement-Pond Co., West Hartford, Conn.* To protect metal-stamping dies from being injured by material that is too thick, continuous limit gage indicates by a signal light, controlled relay, or similar device, when strip or sheet material is too heavy.

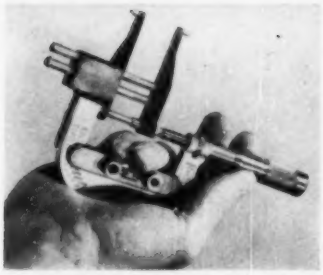
SURFACE COMPARATOR—*Merz Engineering Co., Indianapolis, Ind.* Electronic comparator checks surfaces against an approved sample and assures accurate meter readings. Overall dimensions are 11x9x7 in.



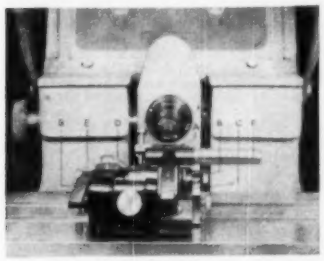
RECORDER—*The Bristol Co., Waterbury 91, Conn.* Running-count recording instrument is for plotting on a circular chart a curve of several operations against time. The hourly rate of production can also be read from the chart.

CLINOMETER — *The R. Y. Ferner Co., 110 Pleasant St., Boston 48, Mass.* Designed on robust lines this instrument gives unimpaired readings through its entire range. A table is provided giving degrees, minutes, and decimals of minutes.

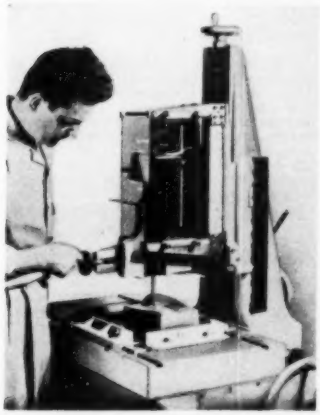
ALARM—*Auth Electric Co., Inc., 34-20 45th St., Long Island City 1, N. Y.* Supervisory annunciator gives visual and audible alarms when trouble develops. It indicates overheated bearings, low fuel level, too low or too high pressures, too high cooling temperatures, etc.



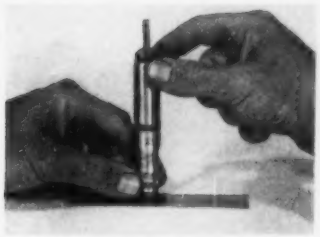
OUTSIDE MICROMETER — *Rimat Machine Tool Co., 1117 Air Way, Glendale, Calif.* The improved-model Microdapter is an attachment for outside micrometers that permits taking precision internal measurements. Measuring points are cone shaped, and project beyond each leg.



UNIVERSAL SCREW STAGE—*Jones & Lamson Machine Co., Springfield, Vt.* Universal screw stage for checking screw threads on optional comparators is claimed to provide a method which simultaneously compares all the elements of the thread with a master gage.

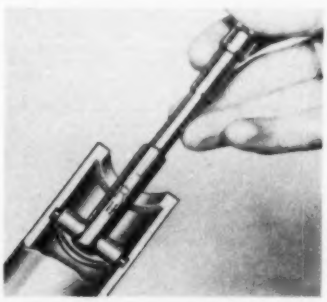


DIE CHECKER — *Engineers Specialties Div., The Universal Engraving & Colorplate Co., Inc., 980 Ellicott St., Buffalo 8, N. Y.* Accommodating die blocks up to 800 lb and sizes up to 22x14x12 in., the Pant-O-Scriber Die Checker gages the contour profiles, flash, and striking surfaces for forging dies and punches, and provides permanent inspection record of the die set.



MICROMETER—*Krouse Testing Machine Co., 573 E. 11th Ave., Columbus 3, Ohio.* Magnifying micrometer is a precision pocket tool for measuring thickness of plating, paint, and enamel. The difference in average instrument readings for a 0.001-in. plating thickness on steel is about 60 div.

MICROMETER TESTER — *The Van Keuren Co., 176 Waltham St., Watertown, Mass.* Lapping and testing kit No. 45 permits machinists and toolmakers to maintain original accuracy of their micrometers. Kit 45 handles micrometers with a range of from 1 to 2 in.



INSIDE MICROMETERS—*Rimat Machine Tool Co., 1117 Air Way, Glendale 1, Calif.* Rimat inside-micrometer size range has been extended to cover all grooves for O-ring packing from No. 11 through No. 79.

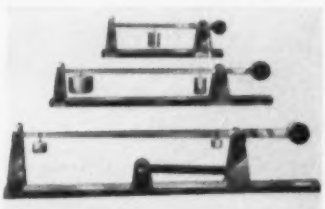
CRANE SCALE—*The A. H. Emery Co., Stamford, Conn.* Hydraulic scale is primarily for measurement of loads as they are handled by a crane. It is also easily adapted for other force and/or load measuring applications.

GAGE BLOCK—*Webber Gage Co., 12900 Triskett Road, Cleveland 11, Ohio.* This Thermo-Guard gage block is insulated from body heat. Thermo-Guards are inlaid in all 2-, 3-, and 4-in. steel carbide blocks.

TEST BLOCKS — *Clark Instrument Inc., 10200 Ford Road, Dearborn, Mich.* Precision test blocks give accurate results on any Rockwell hardness tester.

MICROMETER—*Urbauer Engineering Co., Naperville, Ill.* The Gearmaster ten - thousandth - reading micrometer and special spur-gear charts give users all measurements and characteristics of a gear in one setup, and in a single operation.

GAGE BLOCKS—*The DoAll Co., Desplaines, Ill.* Each piece of the DoAll 83-piece set is subject to a special stabilizing process to insure against growth, shrinkage, and warpage. All amorphous metal and wire edges on gage blocks are removed.



BEAM STANDS — *Airdraulics Engineering, Inc., New Canaan, Conn.* Two models of the Airdraulics Trutorq beam stands, Model SDB-10 and SDB-50 provide a range of torque measurement from 0 to 50 in.-oz up to 50 ft-lb.

MICROMETER STOP UNIT—*The Aero Tool Co., 6930 Avalon Blvd., Los Angeles 3, Calif.* Aero micrometer stop unit uses a 40-pitch ground thread. It can be adjusted in increments of 0.001 in. without removing stop from the machine.

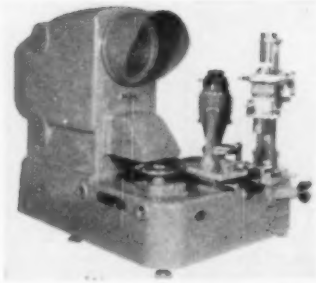
LAYOUT and INSPECTION

PROFILE PROJECTOR—*Hauser Machine Tool Corp., Manhasset, N. Y. (Representative of Henri Hauser, Ltd., Bienne, Switzerland).* Profile projector is for checking and measuring at different magnifications and illuminations. Interchanging of parts for magnification or illumination purposes is eliminated. All optical parts are built in.

COMPARATOR—*Magnetic Analysis Corp., 42-44 12th St., Long Island City, N. Y.* Magnetic analysis comparators provide fast non-destructive inspection of ferrous and non-ferrous materials, indicating variations in composition, condition, structure, and process.

TEMPLET—*Rapidesign, Inc., P. O. Box 592, Glendale, Calif.* Applicable to all axonometric drawing, newly developed ellipse master templet. No. 77 has time-saving features, such as true isometric ellipses, projected from an angle of 35° 16 min, and allowance for pencil point to facilitate accuracy and drafting speed.

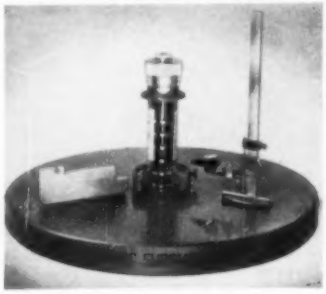
MICROSCOPE—*DuMaurier Co., Elmira, N. Y.* No larger than a mechanical pencil, this pocket-size microscope contains a four-lens optical system which has magnification of 20 diameters.



OPTICAL PROJECTION PANTOMETER—*Optical Measuring Tools Ltd., Slough, England; distributed by George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Optical instrument made in England inspects turbine blades. Accurate gaging is achieved by adaption for a magnification of 30X. Screen has a 6-in. dia.

COMPARATOR TEST HEAD—*General Electric Co., Schenectady 5, N. Y.* More extensive application is provided for GE metals comparator by addition of this comparator test head. Head was developed for use where the test coil is not applicable.

COMPARATOR—*Moore Product Co., Philadelphia 24, Pa.* Bore taper and all finished dimensions on automotive roller-bearing races are measured simultaneously by this automatic pneumatic comparator gage. The instrument furnishes a direct reading of taper variations as small as 0.00005 in.



SURFACE PLATE—*Norton Co., Worcester, Mass.* Ceramic surface plate is for toolroom and inspection use with precision setup and checking measurements which require a high degree of accuracy.

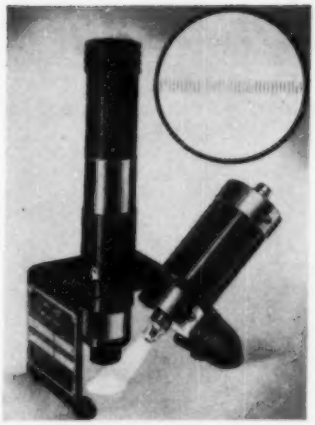
LAYOUT AND INSPECTION PLATE—*All American Tool & Mfg. Co., 1014 W. Fullerton Ave., Chicago 14, Ill.* Precision-ground layout and inspection plate features an adjustable illuminated magnifier. The plate is 11x9 in. and is cross ribbed on the underside for rigidity.

OPTICAL FLAT—*Crane Packing Co., 1800 Cuyler Ave., Chicago, Ill.* Precision-measuring Lapmaster optical flats and monochromatic lights check flatness of any superfinished surface to less than one light band (0.0000116 in.).

MICROSCOPE—*Buhl Optical Co., Pittsburgh 12, Pa.* Pocket microscope for shop, laboratory, and office adjusts to 40, 50, and 60 power. When collapsed it is about the length of a fountain pen with $\frac{3}{4}$-in. diameter.

ILLUMINATOR—*Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.* The Tri-Vert illuminator can be readily attached to the body tube of standard non-objective microscopes for examination of opaque or semi-opaque specimens.

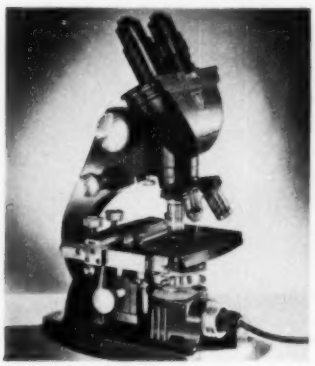
COMPARATOR—*The R. Y. Ferner Co., 110 Pleasant St., Boston 48, Mass.* Chief applications of the Cooke Horizontal Comparator are verification of diameter, roundness, and parallelism of plug-ring and rectangular gages.



MICROSCOPE — *Clarkstan Corp., 11927 West Pico Blvd., Los Angeles 34, Calif.* Model 232 industrial microscope is equipped with a self-light source and built-in measuring scale. It is available with magnification of either 20X or 40X. This unit is focused by means of a friction sliding tube.

MICROSCOPE—*Hauser Machine Tool Corp., Manhasset, N. Y.* Profile-Measuring microscope for high-precision measuring and control of profiles is based on enlarged drawings. Screw threads can be checked for core diameters, pitch, angle of inclination, and form of thread.

DYNAMOMETER — *Wagner Electric Corp., 5488 Plymouth Ave., St. Louis 14, Mo.* Hydraulic dynamometers are offered for load-testing motors. Tests that can be made include idle, pull-in, pull-up, full-load, and locked.



MICROSCOPE — *American Optical Co., Scientific Instrument Div., Buffalo, N. Y.* Tests approximating 20 years' wear revealed less than 0.2 micron backlash in the fine-adjustment screw of the redesigned AO Spencer Microscope.

POCKET MICROSCOPE—*Buhl Optical Co., Desk T-157, 1009 Beech Ave., Pittsburgh 12, Pa.* A special illuminator equipped with a standard-size flashlight battery and bulb has been added to the S129 pocket microscope.

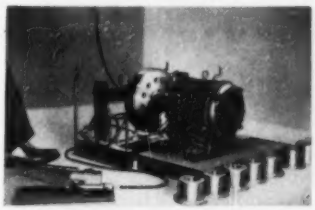
SOUND-LEVEL METER — *Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.* The flashlight size type 410-A sound-level meter is for production testing of machinery, establishing and maintaining design specifications, and other uses.

MICROSCOPE ILLUMINATOR — *American Optical Co., Southbridge, Mass.* The Spencer No. 735 Lamp is a microscope illuminator designed for routine and advanced laboratory work. It furnishes both Kohler and parallel illumination for bright field and phase microscopy.

SONIC ANALYZER—*Panoramic Radio Corp., 92 Gold St., New York 7, N. Y.* Model AP-1 automatically separates the frequency components constituting a complex audio wave and simultaneously measures their frequency and amplitude.

CYCLOGRAPH ANALYZER—*J. W. Dice & Co., 191 River Road, Grand View-on-the-Hudson, New York.* The Model C Cyclograph is a portable instrument operating on the core-less principle for rapid and non-destructive metallurgical examination and sorting of metal parts.

LAYOUT FLUID — *Dayton Rogers Mfg. Co., 2824 13th Ave., S. Minneapolis, Minn.* Solvent added to layout is an acid-cutting material which automatically removes all grit and dirt from the surfaces being laid out.

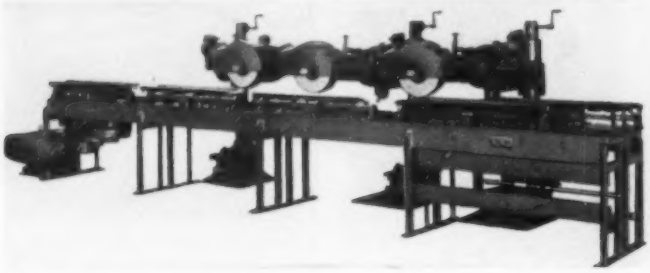


DYNAMOMETER — *Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo.* Built with load capacities of 30 to 300 ft lb., Wagner hydraulic dynamometers are for testing large electric motors.

ULTRASONIC INSTRUMENT — *Sperry Products Inc., Danbury, Conn.* An improved pattern of square-wave "inch markers" on the horizontal axis of the screen of the type-UR Style-50E351 Reflectoscope facilitates interpretation of test results.

Cleaning and Finishing

AMERICAN MACHINIST 37TH ANNUAL REVIEW



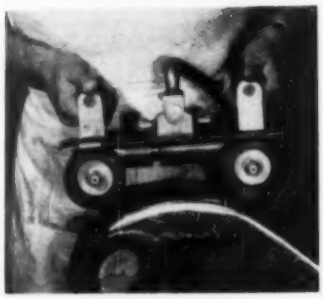
BUFFING, POLISHING MACHINE—*Acme Mfg. Co., 1645 Howard St., Detroit 16, Mich.* Acme horizontal return-type straight-line automatic polishing and buffing machine consists of a 10-ft drive section and a 10-ft chain take-up section bolted together to make a 20-ft straight-line unit.

POLISHER—*Cummins Portable Tools, Div., Cummins Business Machines, Inc., 4740 Ravenswood Ave., Chicago 40, Ill.* Lightweight portable electric tool is for rubbing and polishing metals, woodwork, linoleum, and similar surfaces. It weighs only 4½ lb and has a free speed of 1300 rpm.

CHEMICAL BRIGHTENING—*Technical Processes Div., Colonial Alloys Co., Philadelphia 29, Pa.* Mass chemical brightening process is restricted to aluminum and its alloys in their wrought forms. Brightening is accomplished by dipping cleaned work in hot solution from 5 to 60 sec.

POLISHER—*Bradford Machine Tool Co., Cincinnati, Ohio.* Ten-in. vertical-type portable electric polisher Model 109 is particularly for automotive work. It is driven with a universal ac-dc 110-v motor, 25-60 cycles, 5.5 amps at 700-rpm load speed. Net weight of the tool is 10 lb.

DIAMOND COMPOUND — *Industrial Products Div., Elgin National Watch Co., Aurora, Ill.* Elgin "Dymo" diamond compound is available in the complete range of Bureau of Standards Abrasive Grades and is said to have high resistance to caking or drying out.

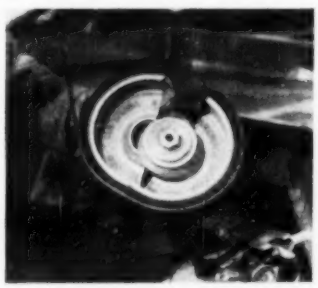


BELT SANDERS — *Buckeye Tools Corp., 21 West Apple St., Layton 1, Ohio.* This air-driven belt sander handles all types of surfaces whether concave or convex and is applicable to metal finishes.

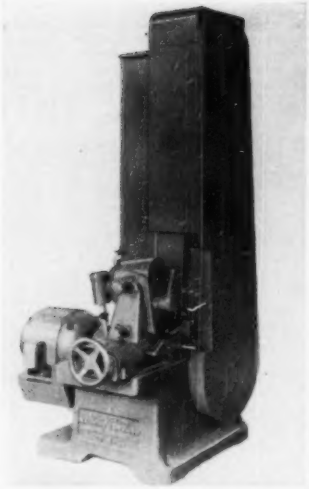
POLISHING MACHINES—*Hammond Machinery Builders, 1630 Douglas Ave., Kalamazoo, Mich.* Single-spindle semi-automatic polishing and buffing machines are used in conjunction with any lathe or contour machine, two with single rotating spindles, and two with rotating stroke-type spindles.

MULTI-PURPOSE STAND — *F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa.* Built for heavy-duty operation the No. 1-C multi-purpose stand carries pans either steam-heated or standard, up to 42 in. dia.

POLISHING WHEELS — *Greene, Tweed & Co., North Wales, Pa.* Wedge-layer Walrus polishing wheel eliminates abrasive injury in fine finishing.



DRUM SANDER—*American Diamond Saw Co., 519 N.W. Park Ave., Portland 9, Oregon.* It is claimed that a 75% saving can be had by using polishing and buffing abrasives in endless belt form on this buffer drum. It has been developed to permit use of less expensive standard strip abrasive.



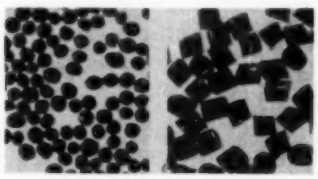
POLISHING MACHINE—*Production Machine Co., Greenfield, Mass.* Type A centerless polishing machine is equipped with a new centerless-belt feed mechanism incorporating roller bearings in gear-reduction units and removable side plates.

BURNISHING COMPOSITION—*Chemclean Products Corp., 64 Sixth Ave., New York 13, N. Y.* Burnishing composition can be used on a variety of metals and is said to bring up more brilliant luster in less time than is usually required by materials now being used for this purpose.

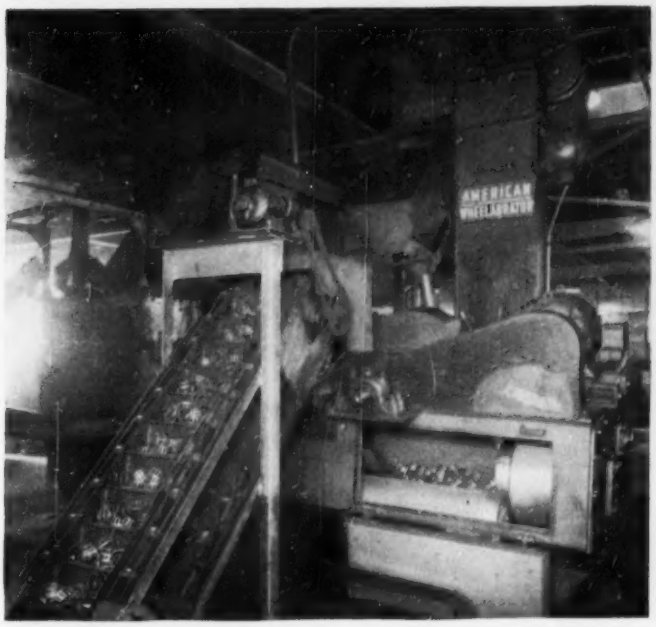
SHOT—*Precision Shot Co., 6432 Cass Ave., Detroit 2, Mich.* "Cutwire Shot" for peening and cleaning is made from SAE 1065 wire and is available in 0.014- to 0.72-in. dia. Life of shot is said to be 1500 cycles. It quickly deforms into full round shape of uniform size which is maintained for 98% of its period of use.

ABRASIVE—*National Metal Abrasive Co., Cleveland, Ohio.* A special treatment of the carbon is said to give Permabrasive shot and grit a softer, more malleable body for metal cleaning.

BLAST-CLEANING SHOT—*American Wheelabrator & Equipment Corp., 719 Byrkit St., Mishawaka, Ind.* Tru-Steel shot, made from genuine heat-treated steel, is for use in all types of blast-cleaning equipment.



PEENING SHOT — *Steelblast Abrasives Co., 6536 Carnegie Ave., Cleveland 3, Ohio.* Genuine cut-steel peening shot has Rockwell hardness ranging from 46 to 52 and 270,000 to 300,000 psi tensile. This shot is reported to last from 20 to 30 times longer than ordinary shot.



SANDBLASTER—*Sandaire Mfg. Co., 1241 Temple St., Los Angeles, Calif.* For cleaning small steel fabrication or large castings, 60-lb sandblasting machine produces a high-velocity abrasive stream. The unit stands less than 3 ft high.

METAL-CLEANING PROCESS — *Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.* The Lo-Hi process for preparation of metals for plating and vitreous enameling is a two-tank procedure which removes soil of all types, and activates the surface of the work.

CLEANING SOLVENT—*Oakite Products Inc., 124 Thames St., New York 6, N. Y.* Compound No. 33 was developed to remove rust, oxides, grease, oils, and shop soils from metal surfaces and to prepare ferrous metals and aluminum for sure-grip adhesion of paint, lacquer, and enamel finishes.

TUMBLAST—*American Wheelabrator & Equipment Corp., 555 So. Byrkit St., Mishawaka, Ind.* The smallest machine in the Wheelabrator Tumblast line, this unit has a 15-in.-dia blast chamber. Work enters the machine by means of the conveyor at the left and is dropped into the blast chamber.

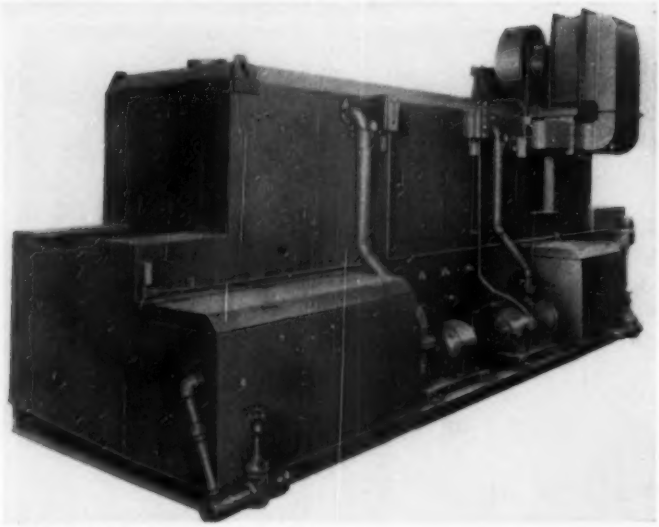
TUMBLING CONVEYORS — *Phillips Mfg. Co., Chicago 45, Ill.* Automatic conveyor with loading and unloading at same end can carry either flat trays or tumbling baskets alternately. Tumbling baskets are for small parts that would cup solvent.

CLEANER — *Chemclean Products Corp., 64 Sixth Ave., New York, N. Y.* Chemclean No. 133 is a di-phase cleaner for pre-cleaning all metals. It removes buffing and drawing compounds, oils, and greases without attack, and is safe to work with.

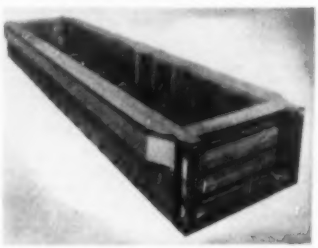
SOLUBLE COMPOSITIONS—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Two Tripoli compositions which are said to combine solubility with really good working properties are 2-S-10 and 2-S-12.

STRIPPER—*Enthone, Inc., 442 Elm Street, New Haven 2, Conn.* Chemical stripper dissolves nickel and other metal coatings from steel without attacking the steel. The stripper is alkaline in nature, can be kept in a steel tank, and requires no electric current.

WATER-WASH COMPOUND—*Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.* A water-wash compound for paint spray booths lubricates the overspray. It coats each particle of paint with a nonvolatile solvent.



SPRAY WASHER—*Detrex Corp., Detroit 32, Mich.* Metal parts washers feature standardized construction so that multiple-wash, rinse, and dryoff stages can be incorporated at minimum cost. Work is pressure-sprayed with cleaning solution from rigidly supported multiple-spray headers.



CLEANING VATS—*Wendnagel & Co., 600 W. Cermak Road, Chicago 16, Ill.* Tubing in lengths up to 22 ft is lowered into this vat on an angle by a crane. Air or steam is forced through the tubing to effect proper cleaning.

NEW STILL DEGREASER—*Phillips Mfg. Co., Chicago 45, Ill.* This 5-gal. per hr still is said to be as efficient as a small degreasing machine. It is electrically heated and has two compartments.

STEAM CLEANER—*Homestead Valve Mfg. Co., Coraopolis, Pa.* Designed especially to fit the needs of small operators and shops, this Hypressure Jenny steam cleaner requires only 27x37 in. of floor space and develops 80- to 120-psi working pressure.

CLEANING UNIT—*Graymills Corp., 2006 Ridge Ave., Evanston, Ill.* Agitor Model H 81 "cold" parts cleaning unit, removes cutting oils from parts or from large castings and assemblies, and is said to be ideal for cleaning dies and machinery parts.

DEGREASERS—*Circo Products Co., 12117 Berea Road, Cleveland 11, Ohio.* Automatic stainless-steel Circo Twin-Tank degreaser is electrically heated and thermostatically controlled. Stainless-steel hot-vapor tank is 18x18x32½ in.

CLEANER—*L & R Mfg. Co., 577 Elm St., Arlington, N. J.* Including hydraulic and mechanical operation the L & R automatic part cleaner is equipped with a complete set of baskets, dividers, and L & R cleaning and rinsing solution.

STEAM CLEANER—*Kelite Products Inc., Box 2917, Terminal Annex, Los Angeles 54, Calif.* Of all-steel welded construction, the Model Q steam cleaner weighs only 465 lb and vaporizes 110 gal of solution per hr.

PAINT REMOVER—*Kelite Products, Inc., Box 2917, Terminal Annex, Los Angeles 54, Calif.* Kelite Formula 504 removes paint, sludge, and light carbon from automotive and aircraft engines and parts, and is for similar metal cleaning.

CLEANER—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Cleaner, Matawan No. 25W, is a nonsilicated soak or electro-cleaner for application where the presence of a silicate in the solution would interfere with subsequent processing.

CLEANING SOLUTION — *Pennsalt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.* Pennsalt Cleaner Z-54 is composed of anhydrous alkaline ingredients and a combination of synergistic surface-active agents. It is for reverse-current cleaning of zinc-base die castings prior to electroplating.

CLEANER—*Sandstorm Mfg. Co., Fresno, Calif.* Self-contained and suction-type blast-cleaning cabinets and associated dust arrestors are designed to use any type of abrasive required for cleaning ferrous and nonferrous metals, or for frosting and etching glass, ceramics, and plastics.

CLEANING—*Safety and Maintenance Co., Inc., New York, N. Y.* Sol-Speedi-Dri is an absorbent compound for floor greases and oils, said to make slippery floors safe.

WIRE-WHEEL BRUSH—*Hewitt-Robins, Inc., 370 Lexington Ave., New York 17, N. Y.* Wire wheel brush has steel bristles firmly imbedded in rubber. It is being produced in 6-, 8-, and 10-in. industrial sizes.

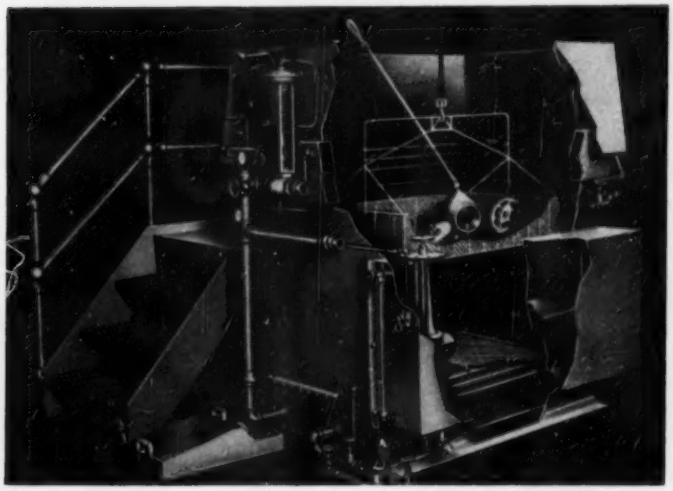
CLEANER—*The DuBois Co., Cincinnati 5, Ohio.* MUL, a ready-to-use emulsion cleaner, combines solvent and emulsion cleaning with the synergetic action of soil penetrating agents. It resists hard water attack and is said to minimize curd formation.

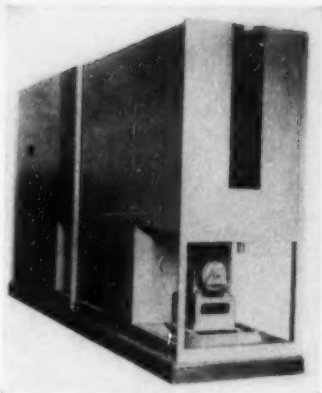
DEGREASERS—*Circo Products Co., 12117 Berea Road, Cleveland 11, Ohio.* Hot-vapor stainless-steel degreaser incorporating automatic control, will clean and dry any metal before and after intermediate processing, especially in industries where plating, painting, or buffing is done.

DIPPING BASKETS—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Engineered dipping baskets to suit unusual designs or standard baskets to fit a given production pattern are available no matter how unusual the specification may be.

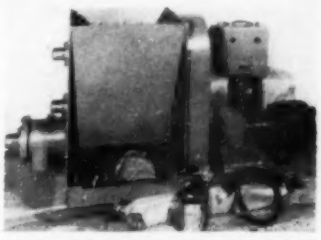
CLEANING MACHINE—*Equipment Div., Magnus Chemical Co., Inc., Garwood, N. J.* Magnus Krazy Dip Senior removes cutting oil and chips, buffing compounds, smut, abrasives, or other deposits resulting from stamping, drawing, cutting, grinding, or other operations.

DEGREASING AGENT—*Bee Chemical Co., 13799 S. Avenue O, Chicago 33, Ill.* Intended for use in standard cleaning equipment for removing grease from metal parts, Mulsolv degreasing agent is non-toxic and non-irritating to skin or nasal passages.





DRYER—*Optimus Equipment Co., 185 Water St., Matawan, N. J.* Mechanical dryer, originally designed for drying of highly polished metal surfaces without water spots, stains, or streaking, has been adopted for all types of drying of metal parts handled on monorail systems.



DRY FEEDER—*Precision Instrument & Control Co., 1828 Columbus Road, Cleveland 13, Ohio.* Robot Chemist automatically feeds dry chemical compounds to washing and cleaning solutions.

DEGREASER—*Detrex Corp., P. O. Box 501, Detroit 23, Mich.* Model VS-800 Detrex Degreaser removes oil, grease, and dirt from metal parts by hot solvent vapors and pressure spraying so that work comes from the machine clean and dry.

METAL CLEANER—*Preventive Maintenance Co., 1997 Fairfield Ave., Bridgeport, Conn.* Readi-Sol is an all-purpose metal cleaner that can be used either as a spray or painted with a brush.

BRIGHT DIP—*Rossaul Co., 170 Fifth Ave., New York 10, N. Y.* Improved Copper-Brite, a non-toxic, non-fuming bright dip for brass, bronze, copper, beryllium copper, phosphor bronze, and nickel silver, is said to lower drag-out by 50%.

CLEANER—*Quaker Chemical Products Corp., Conshohocken, Pa.* The Quaker Formula 100, a powder-type synergized synthetic cleaner, can be used for removal of mineral-oil-type soils. It is used at concentrations of 2 to 3 oz per gal.

LUBRICANT CLEANER—*U. S. Plug and Fitting Co., Canton, Ohio.* Magnetic plugs are said to effectively remove ferrous-metal particles from moving lubricants and hold them. Plugs in standard square head, countersunk, and special designs range in size from ¼ to 1½ in.

STRIPPERS—*Enthone Inc., 442 Elm St., Dept. AM, New Haven, Conn.* Stripper S-17 is recommended for the removal of clear synthetic enamels from highly polished surfaces such as brass, gold plate, and silver.

CLEANING SOLVENT—*The Brooks Boiler Treatment Co., 5304 E. 87th St., Cleveland 4, Ohio.* Aqua Turge is a formulation of strong emulsifiers that is said to penetrate, emulsify, and completely disburse any soil, grease, oil, or film.

STEAM GUN—*Oakite Products, Inc., New York 6, N. Y.* Model 481, with an over-all length of 5 ft, develops sufficient vacuum to discharge cleaning solutions to a height of over 12 ft.

FINISHER — *Hammond Machinery Builders, Inc., 1600 Douglas Ave., Kalamazoo, Mich.* Work-spindle speeds varying from 50 to 150 rpm on the Hammond Super rotary automatic machine for grinding, polishing, buffing, and deburring. Dwell time varies from 1 to 20 seconds.

PLATING MACHINE—*W. S. Rockwell Co., 200 Elliott St., Fairfield, Conn.* Croplater is a complete plating unit, wired and ready for operation on delivery. The machine is primarily for chromium plating.

FLOOR ENAMEL—*Tremco Mfg. Co., Cleveland, Ohio.* Colorfloor XX, a floor enamel paint for concrete floors, uses a rubber base which is resistant to free lime. It is said to dry within 24 hours.

FILTER AID—*Brown Co., 500 Fifth Ave., New York 18, N. Y.* A filter aid approved for use with the du Pont high-speed copper-plating solution is available under the trade name Solka-Floc.

HYDRO-FINISH CABINET — *Pangborn Corp., Hagerstown, Md.* The Hydro-Finish is a modified form of impact blasting with an abrasive suspended in a liquid. Fine mesh abrasives can be used, holding tolerances to 0.0001 in.

LIQUID STAINLESS STEEL—*The Lockrey Co., Plastics Div., College Point, N. Y.* Liquid stainless steel can be applied to any surface by brushing or spraying. Stainless steel is broken down into flakes of microscopic size.

FINISHES—*Quaker Chemical Products Corp., Conshohocken, Pa.* Urea melamine, vinyl, and bis-phenol finishes of both the air-dry and baked type can be stripped in less than five minutes without the use of special equipment.

DIP TANKS—*H. McNaughton Co., 201 Parsons St., Kalamazoo, Mich.* The Electrodip is a thermostatically controlled dip tank made primarily for plastic coating of parts, tools, and dies.

ABRASIVE FINISHER—*Craft Hollow Industries, Wallingford, Pa.* Discette electric hand rotary abrasive finisher is a scaled-down version with utility kit for buffing, drilling, and hole polishing.

ALUMINUM FINISH — *Chemclean Products Corp., 64 Sixth Ave., New York 13, N. Y.* Chemlustre is a finish for aluminum which substitutes a simple dip for polishing. It brings aluminum articles to a highly lustrous semi-satin finish.

METAL PRIMER—*Thompson-Porcelite Paint Co., 330 Race St., Philadelphia 6, Pa.* Led-chroxide multi-purpose moisture-proof metal primer is a balanced blend of red lead, zinc chromate, and iron oxide in a specially developed vehicle.

FIRE-RETARDANT PAINT — *Stallton Chemical Corp., 8-14 37th Ave., Long Island City 1, N. Y.* A fire-retardant and nontoxic paint resists 2000 F flame for 30 min. Called Flame-Seal, the paint requires no mixing of special ingredients and can be applied by brush or spray gun.

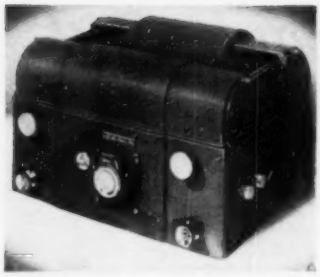
PLATING—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Improved line includes vulcanized rubber for rubber-lined tanks. Two overflow outlets are now provided on all rinse tanks. Solution level is now about 6½ in. instead of 3½ in.

DEBURRING, FINISHING BARREL —*Almco Div., Queens Stove Works, Inc., Albert Lea, Minn.* Deburring and finishing barrel, Model DB-200, offers variable speeds from 6 to 30 rpm. Rollaway perforated hood assures safety.

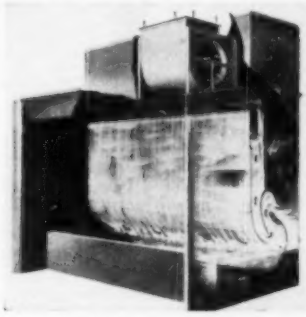
ABRASIVE STICK—*Ideal Industries, Inc., Sycamore, Ill.* Used like an eraser, this fine-grain abrasive stick removes tool marks, scratches, or rust from copper, brass, bronze, iron, steel, aluminum, and other metals.

LACQUER—*The Sherwin-Williams Co., Cleveland, Ohio.* The Sherwin-Williams lacquer Dimenso gives a hammered finish in two colors applied in one operation. The finish has been designed primarily for use by manufacturers who do not have facilities for baking.

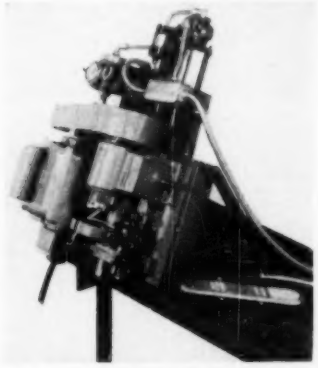
METAL PRIMER—*Tremco Mfg. Co., 8701 Kinsman Road, Cleveland, Ohio.* Tremco quick-drying chromated metal-priming treatment makes it possible to apply two coats of metal in a single day. The priming coat dries to touch in 10 min and may be handled in 20 min.



SURFACER — *Buehler Ltd. 165 W. Wacker Drive, Chicago, Ill.* The AB dual-belt wet surfacer is for the flat preparation of metal or graphic specimens. It is powered by a ½-hp, 2-speed motor.



SPRAY BOOTH — *Newcomb-Detroit Co., 5741 Russell, Detroit 11, Mich.* Providing suction of paint-ladened air at both the top and bottom of a water curtain, the Roto-Wash spray booth is said to eliminate paint fog in the booth between spraying cycles.



END-FINISHING MACHINE — *Pines Engineering Co., Inc., Aurora, Ill.* Automatic air operation is available for simplified high-speed tube deburring and other end-finishing operations on the Series 600 tube-end rod and finishing machine.

COATING—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* The Kote-Rax Grade K rack coating is designed to insulate and protect plating racks and figures in all types of electroplating and anodizing solutions.

PAINT PRIMER—*The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 15, Mass.* Improved Totrust, a rust-inhibitive paint primer and finish coat combined, offers deeper penetration, high gloss and tougher weathering.

PHOSPHATE COATING—*Detrex Corp., Detroit 32, Mich.* Combination cleaner and phosphate-coating compound is for steel and other ferrous metals to provide a base for paint coating.

MULTI - TUMBLER — *Hungerford Corp., Big Flats, N. Y.* Deburring and polishing machine, known as the Multi-Barrel tumbler for mass-finishing of metal and plastic parts, handles up to 15 different items at one time without mixing.

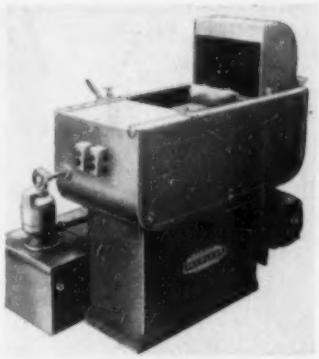
DRY PLASTIC COATING—*The H. A. Montgomery Co., 17191 Swift Ave., Detroit 3, Mich.* Dry non-tacky plastic, mar-proof coating protects pre-polished or highly finished metals from damage during die- or roll-forming operations, or machine handling. It is applied to metal surfaces in cold-water solutions by spraying or rolling.

PAINT SPRAY UNIT—*Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill.* Lightweight portable Binks DP paint spray unit weighs 47 lb and delivers 1 hp. It handles enamels, lacquer, shellacs, and varnishes.

ELECTROPLATING ANODE — *Wagner Bros. Inc., 402 Midland, Detroit 3, Mich.* Copper flat-top electroplating anode eliminates gates and flash which often causes hanging on baskets. Freedom from cavities prevents inclusions of copper oxide, silica, and dirt.

RUST INHIBITOR—*Al-Tex Products Co., 1900 Euclid Ave., Cleveland, Ohio.* "End-O-Rust" paint has a very low acid value and a low oxidation rate. It is said to withstand extreme conditions of expansion or contraction and corrosive elements.

SURFACE COATING—*Lowebco, Inc., Chicago, Ill.* Coating for finishing, protecting, and decorating exposed parts of machines is touch-dry in 30 min forming a durable glossy finish that does not scale, crack, check, or dust off.



SURFACING MACHINE—*Production Machine Co., Greenfield, Mass.* Developed to answer an increasing demand for a smaller size, less expensive machine for surfacing and finishing small castings, forgings, diecastings, and metal products, this unit weighs approximately 800 lb.

PIPE ROLL—*Eriez Mfg. Co., 772 E. 12th St., Erie, Pa.* Fabricated from permanent non-electric magnets, these magnetic rolls are for the "drag out" of pipes and shapes from galvanizing pots.

METAL PRIMER—*The Wilbur and Williams Co., Greenlead and Leon Sts., Boston 15, Mass.* Rust-O-Primer, is a vinyl-base quick-drying wet primer, applicable over wet or dry, clean or rusted metal, including steel, aluminum or galvanizing, providing a hard foundation for any paint.

PRIMER—*The Princeton Paint Lab., Princeton, N. J.* Primer No. 10 air drying and baking primer, can be used on aluminum alloys, magnesium alloys, monel, tin, steel, copper, and galvanized metal; and can be applied by spray, dip, or brush.

METAL PRIMER—*Rusticide Products Co., Cleveland, Ohio.* Ospho is applied directly over rusted surfaces. When applied it causes iron oxide (rust) to change chemically to iron phosphate, an inert, hard, dark-gray substance.

COATING—*Vickers Electric Div., Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.* Protective coating listed as "V" finish is resistant to corrosion, salt spray, humidity, and fungicidal conditions.

ZINC PLATING—*The Allied Research Products, Inc., 4004 E. Monument St., Baltimore 5, Md.* Iridite Bright dip is for use in automatic zinc-plating installations. It makes possible a bright chromate coating using as few as three stations after plating.

ENAMELS—*E. I. duPont de Nemours & Co. Inc., Wilmington 98, Del.* Vitreous enamel for aluminum, in comparison with vitreous coatings for steel, are said to have the advantage of superior impact and flux resistance, and resistance to thermal shock.

PRIMER—*The Di-Noc Co., 1700 London Road, Cleveland, Ohio.* Prepared in both neutral gray and white, Di-Noc Metal N33 readily takes an overcoat of most regular finishes.

Plant Service Equipment

AMERICAN MACHINIST 37TH ANNUAL REVIEW

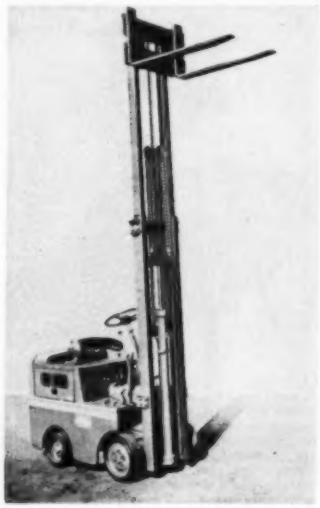
HAND TRUCK—*Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia, Pa.* Non-tilting fork-model battery-powered hand truck, is equipped with revolving fork carriage which rotates 360° to accomplish such tasks as emptying scrap bins.

FORK TRUCK ATTACHMENT—*Mercury Mfg. Co., 4114 S. Halsted St., Chicago 9, Ill.* The Roto-Lift assembly is offered for the company's 2- and 3-ton Yak and Yank fork trucks. The assembly provides 180° rotation of forks in either right-hand or left-hand direction.

LOADER—*Lull Mfg. Co., 3612 E. 44th St., Minneapolis 6, Minn.* Low travel loader is a combination loader, carrier, and motor truck. It self loads from the side onto the carrying deck and operates at speeds up to 30 mph.

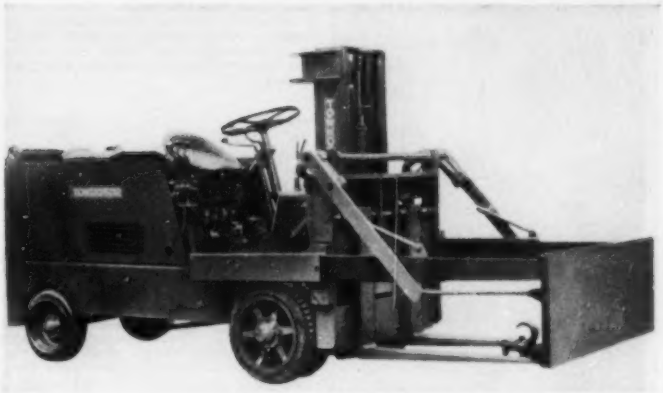
HOISTER—*Lewis-Shepard Products, Inc., Watertown, Mass.* Type DH Handy Hoister is a light lifter for raising and lowering all kinds of loads to 500-lb capacity. The hoist has a 5½-in. lowered height, and 58-in. lifting height.

STACKER—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* The Transrider stacker's telescopic lift mechanism extends to 130 in. Capacity is 2000 lb with a 48-in. load, 2500 lb with a 36-in. load, and 3000 lb with a 28-in. load.

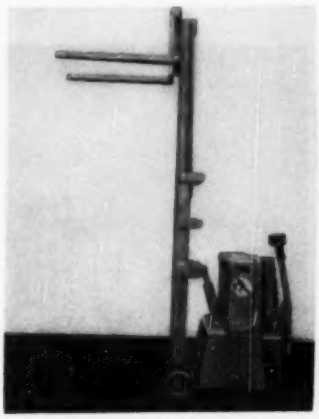


FORK LIFT—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* The Hi-Lo-Stack device now available in a special design for the Clipper models has a collapsed height of 83 in., a maximum lift of 130 in.

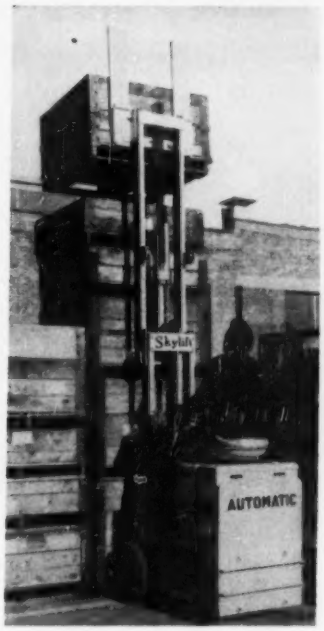
GAS TRUCK—*The Yale & Towne Mfg. Co., Philadelphia, Pa.* Gasoline-powered industrial truck, the Lift King, has fluid-drive automotive controls, hydraulic piston lift, and low mast height.



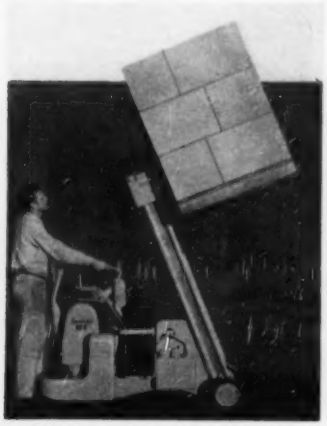
FORK LIFT—*Towmotor Corp., Cleveland, Ohio.* Towmotor Unloader, for carrying heavy dies to and from the die table, has a capacity of 8900 lb at 25-in. load center and a lift height of 72 in.



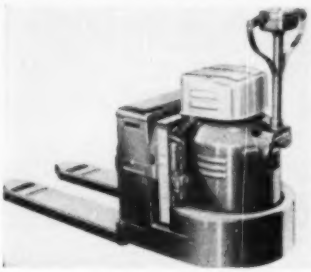
ELECTRIC TRUCKS—*Lewis-Shepard Products, Inc., 265 Walnut St., Watertown, Mass.* For both horizontal and vertical movement of unit loads, this counterbalanced fork truck can handle loads up to 1000 lb and 48 in. long. All controls are in the handle head.



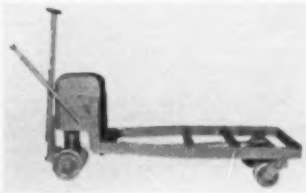
FORK TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Model FF is made in 1000- and 1500-lb capacities.



STACKER—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Battery-operated truck is available in two models: single lift (SCL) and telescopic (SCLT). Units having over-all heights of 79 and 83 in. respectively.



HAND PALLET TRUCK—*Towmotor Corp., Cleveland 10, Ohio.* Battery-powered hand pallet truck is equipped with a safety handle which has control buttons for either left- or right-hand operation.

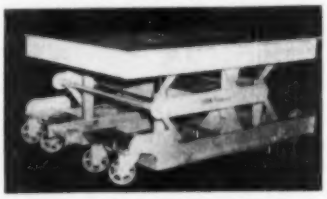


LIFT TRUCK — *Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.* The model MD hydraulic lift truck has a load capacity of 6000 lb and is built in 20- and 25-in. widths.

ELECTRIC TRUCKS — *Barrett-Cravens Co., 4601 S. Western Blvd., Chicago 9, Ill.* Gas-electric Ready Power units in the Barrett Power Ox line of electric lift trucks, pallet trucks, and tractors, provide a power supply that delivers maximum voltage 24 hours a day.

PLANT SERVICE EQUIPMENT—Industrial Trucks

TRUCKS—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* The Lift-King line of electric trucks provides low mast heights with high free lifts. One series has a total lift of 130 in., and a collapsed height of 83 in. It will carry up to 6000 lb.



DIE TRUCK—*Lyon-Raymond Corp., 1397 Madison St., Greene, N. Y.* Hydraulic elevating trucks for dies has a capacity of 20,000 lb and 60x84 in. top.

DIE HANDLING TRUCK—*Lyon-Raymond Corp., 4751 Madison St., Greene, N. Y.* Heavy-duty hydraulic die-handling truck has a range of elevation from 28 to 44 in. A winch arrangement draws dies from presses to the table.

FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Gas-powered Clipper has a 2000-lb capacity. Fork-lift truck has a load center 24 in. from heel of forks.

FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Electric fork trucks in special short-turn models are of 2000-, 4000-, and 7000-lb capacity.

EXTENSION SHOES—*Hyster Co., Portland 8, Oregon.* Straddle-truck extension shoes increase possible length of palletized loads while eliminating necessity of special large skids or platforms.

FORK-LIFT TRUCK—*Elwell-Parker Electric Co., Cleveland, Ohio.* With top-of-platform range of 12 to 36 in., the Elwell-Parker medium-high fork-lift truck is available in capacities of from 4000 to 10,000 lb.

HAND TRUCK—*Aerol Co., Inc., 2820 Ontario St., Burbank, Calif.* Aerotruker, a new multi-purpose hand truck, can be operated through its normal life without greasing.

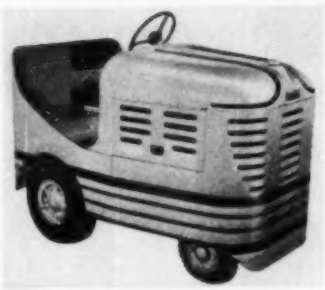
ROTATING FORK—*The Elwell-Parker Electric Co., Cleveland, Ohio.* Two-way fork attachment simplifies handling heavy cylindrical objects. This three-prong fork used with a rotating head on a truck-lifting mechanism handles upending and transporting of heavily loaded steel barrels.

POWER TRUCK — *Lewis-Shepard Products, Inc., 210 Walnut St., Watertown 72, Mass.* Power truck retains all features of Jacklift walkie electric truck and adds a through corridor from which operator can control all functions of truck while riding along with it.

DUMP TRUCK — *Mercury Mfg. Co., 4114 S. Halsted St., Chicago 9, Ill.* Designed for bulk handling, body of electric end dump truck dumps by gravity when released by means of a lever, convenient to the operator.

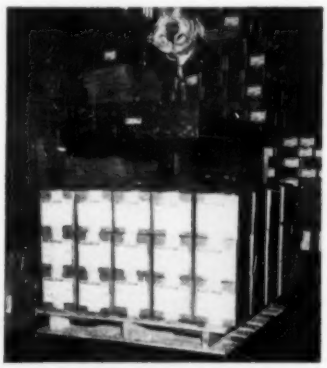
LOAD CARRIER—*Market Forge Co., Everett, Mass.* Truck is 30 in. wide with 60-in. length of loading space between end racks. Capacity is 2500 lb distributed load.

FORK EXTENSIONS—*Lewis-Shepard Products, Inc., 271 Walnut St., Watertown 72, Mass.* Slip-on fork extensions make it possible to handle loads of different lengths efficiently with the same fork trucks.



TOWING TRACTOR—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* A new steering axle, designed to provide full protection for tires, is standard on the redesigned Clarkat industrial towing tractor.

LIFT TRUCK—*Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.* Half-ton truck can be employed as a general-purpose floor truck as well as a lift truck. It provides a 2-in. lift for loads up to 1000 lb.

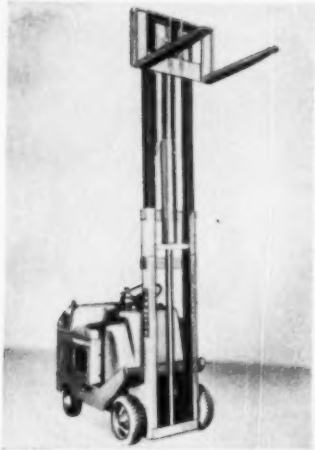


MANSAVER PALLET GRAB—*Mansaver Industries, Inc., 310 East St., New Haven, Conn.* This grab is for plants that wish to stack higher than the normal electric lift truck will stack. Lifting point is over centerline of load.

HAND-TRUCK EQUIPMENT—*Moto-Truc Co., Cleveland, Ohio.* Motor for hand-truck equipment permits accessibility to operating parts. Larger armature and field coils, high starting torque, and lower draw on battery are features.

LIFT TRUCK—*Lyon-Raymond Corp., 1202 Madison St., Greene, N. Y.* Totepan lift truck, adjustable in width and lowered height, can be used with practically all standard totepans, ranging in width from 8 to 24 in.

DIE TRUCK—*Lyon-Raymond Corp., 2248 Madison Street, Greene, N. Y.* Die truck has a 16,000-lb capacity. The hydraulic elevating truck has a 48x57-in. platform. Roller top consists of five rows of rollers placed on 4-in. centers.

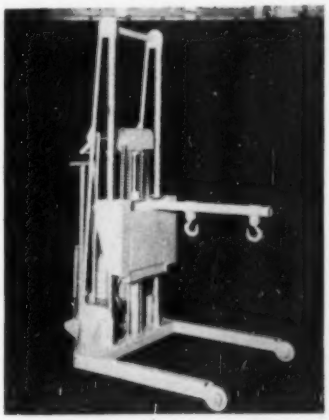


FREE-LIFT MAST—*Towmotor Corp., 1226 E. 152nd Street, Cleveland 10, Ohio.* High free-lift masts on the Towmotor Models LT-40, LT-44 and LT-48 have a total lift of 130 in. and a free lift of 65 in.

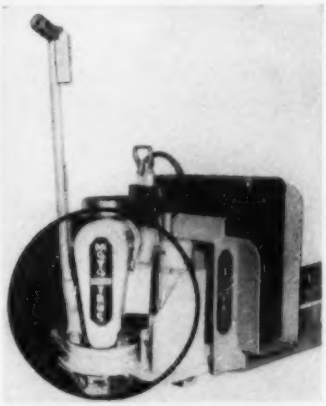
FORK TRUCKS—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* The redesigned Clark Truckloader fork truck has a 1000-lb capacity. Steering column is forward to provide more leg room.

FORK TRUCK—*Mercury Mfg. Co., 4114 South Halsted St., Chicago 9, Ill.* Designed to meet demand for extremely-compact maneuverable chassis to operate on small elevators or in congested areas, this fork truck has overall length, when carrying a 48-in. long pallet load, of 103 in.

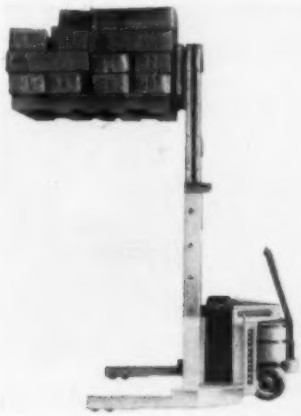
FORK TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* A new pallet and a push-pull attachment for Skylift electric fork trucks permits mechanized shipment without the use of pallets in transit. The pallet is of corrugated metal.



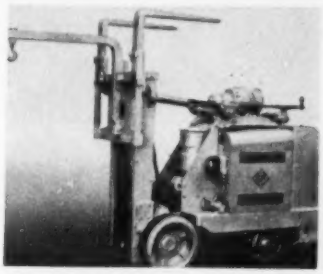
LIFT TRUCK—*Lyon-Raymond Corp., 1976 Madison St., Greene, N. Y.* Special truck handles delicate-but-heavy 300-lb electrical instruments and features a hydraulic elevating boom.



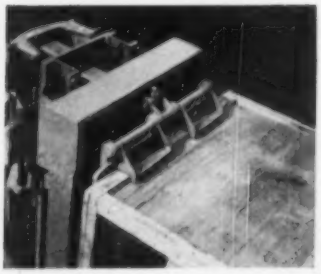
HAND-TRUCK MOTOR UNIT—*Moto-True Co., Cleveland, Ohio.* A motor for motorized hand-truck equipment permits accessibility to all operating parts. The ball-bearing motor has larger armature and field coils, high starting torque and lower draw on battery.



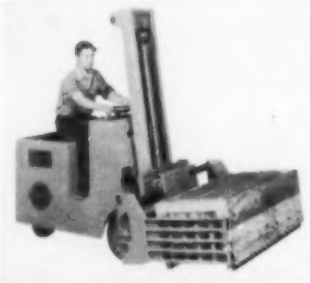
LIFT TRUCK—*Revolvator Co., North Bergen, N. J.* Telescope truck permits steering 48x48-in. pallets to ceiling (115-in. lift). Capacity is 2500 lb, collapsed heights, 68 and 83 in.



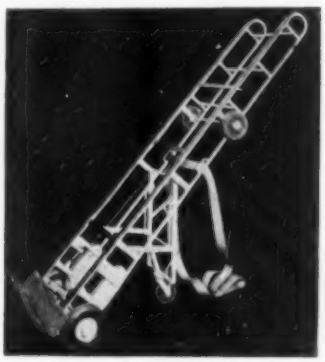
FORK TRUCK—*The Elwell-Parker Electric Co., Cleveland, Ohio.* Truck attachment provides fork and boom in one unit. It is useful where loads are heavy and vary in shape and size.



TRUCK ATTACHMENT—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Attachment handles fragile wood crates which are lifted by the edge. Notched design permits handling crates of varied sizes in vertical or horizontal position.



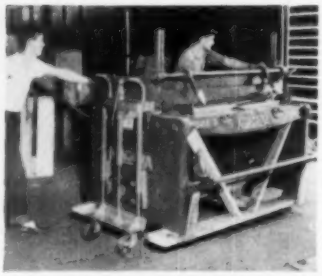
CLAMP TRUCK—*Baker Industrial Truck Div., The Baker-Raulang Co., 2168 W. 25th St., Cleveland 13, Ohio.* The Baker clamp truck utilizes hydraulically operated clamp arms to grip the load for lifting and transporting.



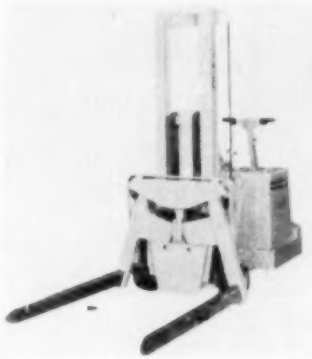
TRUCK—*Associated Services, 224 W. Main St., Carlinville, Ill.* Escort truck is for use where there is a problem of moving over curbings or up a flight of stairs. The steel model of this type has a capacity of 1500 lb.

SIDE-SHIFTING ATTACHMENT—*Lewis-Shepard Products, Inc., 281 Walnut St., Watertown 72, Mass.* Shifting of fork by this truck is controlled by a hydraulically operated "deadman" type lever, located on the operator's cab.

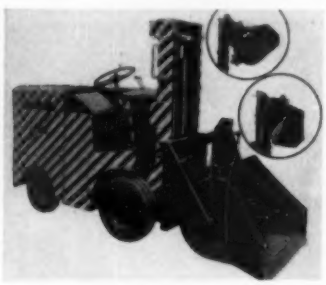
HAND TRUCK—*Business Equipment Specialists, 19 West 44th St., New York 18, N. Y.* Weighing only 25 lb, the Fold-A-Way hand truck, which pulls open like an accordion to a full height of 42 in., can carry 700 lb.



LIFT—*Skarnes Engineering and Supply, Inc., 2428 Riverside Ave., Minneapolis 6, Minn.* The Rol-A-Lift models handle crated or uncrated materials and products. The Model M-2 has a 2000-lb capacity.

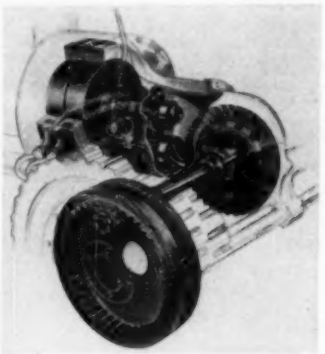


FORK TRUCK—*Yale & Towne Mfg. Co., Philadelphia.* Hydraulically adjustable fork on this model Bunny-hugger Worksaver handles bales of fabric, large crates, or pigs without the use of skids or pallets.



FORK TRUCKS—*Crescent Truck Co., Lebanon, Pa.* 3000- and 4000-lb electric industrial fork trucks are equipped with pneumatic tires and an automatic self-loading scoop in capacities to 15 cu ft. Hydraulic self-actuating cylinder and metering valve assure dumping at desired speeds.

LOADER—*Tracto-Motive Corp., Deerfield, Ill.* Model TL-B Tracto-Loader has a 10-cu ft standard bucket. Overall length with bucket down is 9 ft 5 in.



INDUCTION DRIVE—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Power from the truck engine is transmitted to the Clark Dynatork drive by means of magnetic induction. Two magnetic coils are mounted within the flywheel and are surrounded by magnetic poles. They rotate with the flywheel and are the driving members—one coil for forward, and one for reverse.

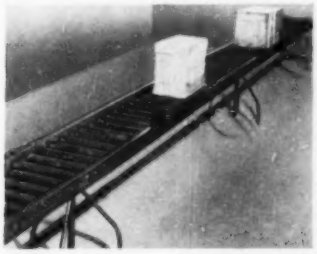
HYDRAULIC LIFT—*The Lange Co., Milwaukee, Wis.* The "Mobil-Draulic" lift is a combination hydraulic elevator and hand-operated four-wheel truck. It is elevated by means of a hand-operated hydraulic pump.

FORK TRUCK—*Crescent Truck Co., Lebanon, Pa.* Electric fork truck has maximum lift of 120 in. Crescent Aisle Saver with a 2000-lb capacity has free initial lift of 63½ in.

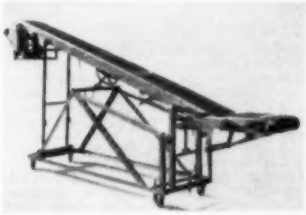
PALLET TRUCK — *Lyon-Raymond Corp., 2441 Madison St., Greene, N. Y.* Expendable 4-way corrugated-paper pallets having large cylindrical supporting columns, can be handled by this hand pallet truck. Capacity is 2000 lb.

HYDRAULIC SCOOP—*Yale & Towne Mfg. Co., Chrysler Bldg., New York 17, N. Y.* Manufactured in sizes ranging from 12- to 27-cu ft capacities, hydraulically operated scoops can be quickly mounted on standard fork-lift trucks.

OVERHEAD CONVEYOR—*Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich.* Light and easily installed, the Junior conveyor has a recommended capacity of 400 lb. It can be assembled and disassembled without tools.



CONVEYORS—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Gravity roller conveyors are offered in 5- and 10-ft lengths and widths from 6 to 32 in. in increments of 2 in.

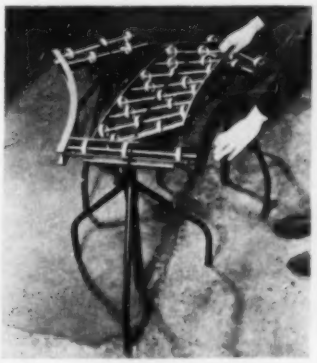


CONVEYOR—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Available with belts 6 to 36 in. wide, in lengths of 12, 15, 18, 20, and 24 ft, the Sage Portable Belt Booster is primarily a floor-to-floor conveyor and stacker.

CONVEYOR BELT—*The Russell Mfg. Co., Middletown, Conn.* Conveyor belt, molded with a corrugated surface, will raise light goods in cartons or heavy materials in bags up inclines of 30° to 40°.

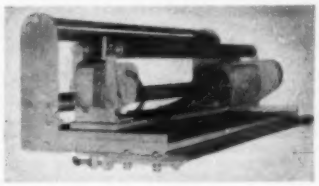
CONVEYOR—*J. C. Corrigan Co., 41 Norwood St., Boston 22, Mass.* All-purpose portable conveyor handles any ordinary bulk material as well as bags, boxes, crates, etc. The 14-in. conveyor can be operated horizontally or elevated.

CONVEYOR—*The George Haiss Mfg. Co. Inc., Div. Pettibone Mulliken Corp., 140 First St., Park Ave, New York 51, N. Y.* Model 485-A all-aluminum conveyor handles bags, bundles, boxes, crates, and cartons weighing up to 500 lb at the rate of 30 per min.

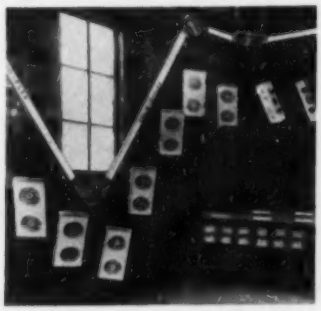


"Y" SWITCH—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* The Sage "Y" switch directs flow of material from one single line into two lines, parallel or converging at 45° angles, either to right or left. To change direction the operator flips the center section and locks it in position.

CHAIN CONVEYOR—*Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich.* The Webb "Towveyor" is a continuous-chain conveyor with the chain running in a steel slot below the floor. A towing pin device is bolted to the end of the standard four-wheel truck or trailer.



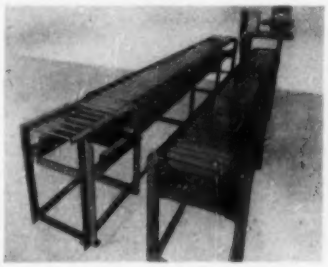
BELT GUIDER—*J. W. Greer Co., Cambridge 39, Mass.* Light canvas or coated fabric conveyor belts are held on center or moved back to center if out of line by application of this automatic belt guider.



OVERHEAD CONVEYOR—*Chain-O-Flex Corp., Franklin Park, Ill.; distributed by Industrial Equipment Company, 315 N. Ada St., Chicago 7, Ill.* Chain-O-Flex is a flexible-chain-conveyor packaged product for use where a constant flow of material or assembled products is needed.

CONVEYOR — *The Leeds Electric & Mfg. Co., Hartford, Conn.* Utilizing a conveyor chain, a balanced-weave wire-mesh belt is guided around practically any curve producing a powered flat conveyor.

BELT CONVEYOR—*The E. W. Bushman Co., Winton Place Station, Cincinnati 32, Ohio.* Available with 10- and 15-ft booms, the Trojan portable belt conveyors can handle a maximum total load of 400 lb. Belt width is 12 in. and over-all width of conveyor is 2 ft 8¼ in.

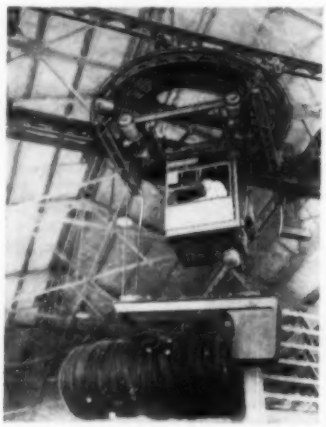


CONVEYORS—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Special conveyors of the apron or slat type are now available with wood or steel slats.

CONVEYOR—*Wilkie Co., 5520 Arch St., Philadelphia 39, Pa.* Step-down between conveyor sections is eliminated by locks of the recently developed portable telescopic conveyor. No bolts or clamps are used, but the locking arrangement correctly positions sections.

PLANT SERVICE EQUIPMENT—Miscellaneous Materials Handling

CRANE—*Wayne Crane Div., American Steel Dredge Co. Inc., Fort Wayne, Ind.* Crane travels on rubber tires at speeds up to 10 mph and can turn completely around in a 22-ft radius. Convertibility provides a ½-yard clamshell, a 5-ton utility crane, or a magnet crane, using the same 30-ft boom.

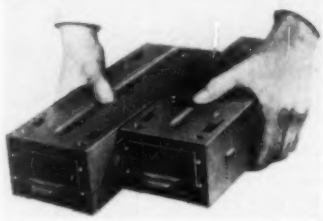


LIFT—*Cleveland Tramrail Div., Cleveland Crane & Engineering Co., Wickliffe, Ohio.* Rotating carrier has five travel motions: hoisting, tilting, trolley travel, bridge travel, and rotation. Speeds of equipment are: bridge 400 fpm, trolley 200 fpm, hoist 50 to 80 fpm, and rotation 75 fpm.

POSITIONER—*Lyon-Raymond Corp., 4758 Madison St., Greene, N. Y.* Offered in several models, hydraulic elevating positioner has mounting plates to which various types of fixtures can be installed.

STEEL PLATFORMS—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* For use with any type of lift truck, these custom-built corrugated all-steel platforms are cold pressed from sheets of formed corrugated heavy-gage steel.

DYNA-SWITCH—*W. C. Dillon & Co. Inc., 5410 W. Harrison St., Chicago 44, Ill.* Dillon Dyna-Switch slips on hoist or crane hooks, and loads are lifted beneath it in the usual fashion. The circuit cuts out the motor when capacity is exceeded.



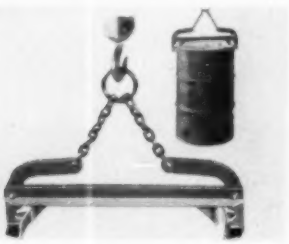
DRAWERS—*The Cincinnati Ventilating Co., Inc., Covington, Ky.* Interlocking drawer units of all-steel construction are designed for parts storage. Drawers are 11 11/16 in. front to back, 3 15/16 in. wide, and 3 in. deep.

WALL CABINET—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Specifically designed to service welding needs of small garages, machine shops, plumbers, blacksmiths, and farmers, compact wall cabinet holds a great variety of welding rods in small number.

PACKAGING MEDIUM—*Pulp Reproduction Co., Milwuakee, Wis.* Protective packaging medium is made of molded wood pulp. For square and rectangular items, standard corner pieces provide necessary protection.

TRAMRAIL CRANE—*Forker Corp., Cleveland 6, Ohio.* Unit is of floating-suspension design and employs swiveling-end trucks and flexibly suspended runways to eliminate the possibility of binding.

CRANE—*Clyde Iron Works, Inc., Duluth 1, Minn.* Handy-Crane can pick up a load and carry it wherever a tractor can go. It has a high lifting capacity of 4 tons, and it revolves 320°.



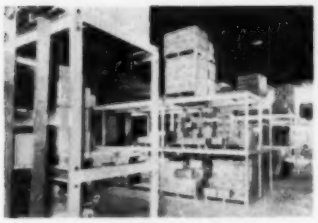
LIFTER—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Of all-steel construction with heavy-welded chain, this lifter handles open and closed steel drums in a vertical position.

WINCH—*Lewis-Shepard Products Inc., 268 Walnut St., Watertown 72, Mass.* Planetary-gear winch can be mounted in any position on a flat surface 5x5¾ in. in size. Mechanism is contained within the winch drum. Direct cable pull is 600 lb.

LIFTING MAGNET—*Ohio Electrical Mfg. Co., Cleveland, Ohio.* Lighter-weight lifting magnet is used with mobile-type cranes. It weighs approximately 20% less than heavy-duty types and has 39- or 45-in. dia.

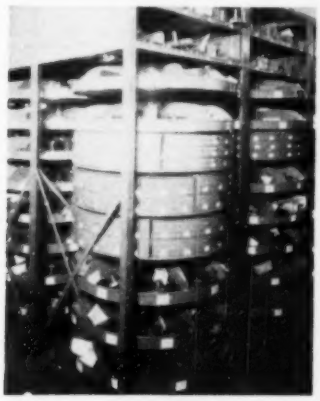
HAMILTON STACKER—*The Hamilton Tool Co., Hanover at 9th, Hamilton, Ohio.* The Portelevator stacker is of fabricated construction and utilizes the Portelevator lifting principle. Platform automatically locks at any position and does not slip or settle under the load.

CROWFOOT ATTACHMENTS—*J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* Adjustable crowfoot attachments are said to combine through the medium of one tool, the flexibility of the detachable socket system with the advantages of the open-end adjustable wrench.



PALLET RACK—*Burke Barlett Co. Inc., 708 Stephenson Bldg., Detroit 2, Mich.* Simplicity is the keynote of this prefabricated pallet rack. It is constructed of two parts; an upright end member which can serve at either end or between sections, and the bed member.

STORAGE BIN—*Burroughs Mfg. Co., Kalamazoo, Mich.* Flexi-bin for parts storage is assembled without use of nuts or bolts. Unit is based upon assembly of back, sides, top, and bottom.



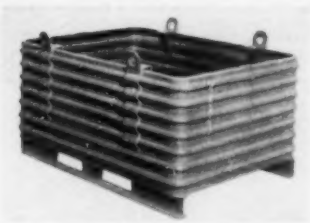
ROTATING SHELF — *The Frick Gallagher Mfg. Co., 400 Shubert Bldg., Philadelphia 2, Pa.* Circular rotating shelf units called Rotabins reduce time required for servicing and sorting parts and tools.

SAFETY HOIST HOOKS—*The Brewer-Titchener Corp., Cortland, N. Y.* The BTC drop-forged safety-hoist hooks give automatic mousing action with a safety-tie lip lock holding the point of the hook and preventing the sling from slipping off.

HAND HOIST—*Lewis-Shepard Products, Inc., Watertown, Mass.* Employing a planetary-gear-drive winch, raising and lowering lifting carriage 1½ in. per rev. of the crank, the "Handy Hoister" can lift 1000-lb loads to a height of 58 in.

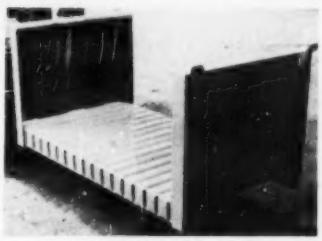
LIFTER—*Pucel Enterprises, Inc., 3746* Kelley Ave., Cleveland 14, Ohio. Multipurpose non-slipping Gonser Grizzly is an all-jobs lifter for handling bulky and awkward materials and equipment in machine shops.

PORTABLE ELEVATOR — *Barrett-Cravens Co., 4609 So. Western Blvd., Chicago 9, Ill.* This one-man-operated portable elevator offers a capacity of 500 lb which can be lifted from 1 to 5 ft. Over-all height is 6 ft.



STACKING BOX—*The Palmer-Shile Co., Detroit 27, Mich.* All-steel welded stacking box has a 4-way entrance and a corrugated bottom. Boxes are built to required dimensions, including underneath clearance.

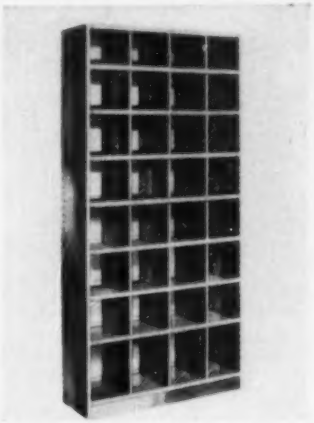
SLOPED-BOTTOM BOX — *Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Sloped-bottom box and stand simplifies small parts handling. Operation is controlled by lever located on the box.



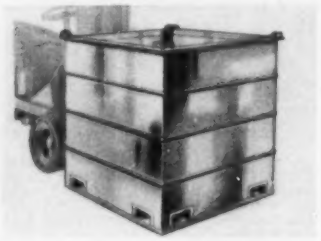
PALLET RACK—*Union Metal Mfg. Co., Canton, Ohio.* Best features of both pallet and rack are combined in a new open-side pallet-rack. Open sides make materials easily accessible.

SHEAVE—*Allis-Chalmers, Milwaukee, Wis.* Allis-Chalmers is discontinuing its adjustable threaded plate sheaves in the larger sizes. Adjustable sheaves up to and including 6.125-in. outside circumference are still available.

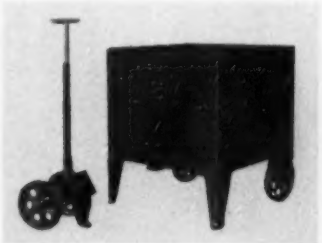
HYDROSCALE — *Hydroway Scales, Inc., 7632 Fenkell Ave., Detroit 21, Mich.* Hung from cranes and chain hoists the Hydroscale comes in 2-, 5-, and 10-ton models. It automatically weighs loads during lifting operations.



STORAGE BIN — *Lyon Metal Products, Inc., Aurora, Ill.* Dividers in the 78-in. Lyon bin units are adjustable horizontally every inch and shelves are adjustable up and down every 1½ in. when dividers are not used.

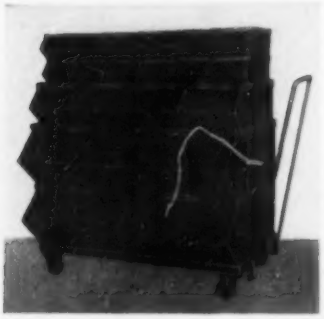


STORAGE BOX—*North American Industries, Inc., 2100 N. Kolmar Ave., Chicago 39, Ill.* Utility storage box was conceived for use with all fork-lift tractors, overhead cranes, and hand-operated pallet-bed trucks. It has 64-cu ft capacity.



SCRAP TRUCK—*Factory Service Co., Milwaukee 9, Wis.* Usefulness of the revolving-head fork truck is increased by this new scrap truck, part of the Turner System of materials handling. Fork truck can pick up the unit from either front or back, and can move it anywhere.

PORTABLE RACK—*Equipment Mfg. Co., Inc., 21550 Hoover Road, Detroit 5, Mich.* Portable rack for stacking palletized materials is said to accelerate order-picking and case handling by permitting the tiering of pallet loads to ceiling heights without tying up low-level goods.



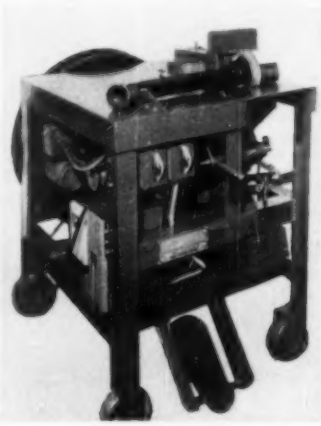
STACKBINS—*Stackbin Corp., 1139 Main Street, Pawtucket, R. I.* Standard stackbin sections are interlocking steel units of 2 to 6 bins in five different sizes.

DUMP BOX—*Equipment Mfg. Co., 21550 Hoover Road, Detroit 5, Mich.* Constructed of heavy reinforced steel this round-bottom dump box tilts 90° and facilitates loading, unloading, and cleaning.

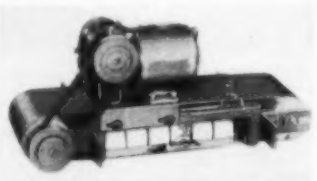
BATTERY CHARGER—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* The Rectox copper-oxide battery charger is suited for on-the-spot charging of industrial-truck batteries.

WRAPPER—*The Nox-Rust Chemical Corp., 2419 South Halsted Street, Chicago 8, Ill.* Rust preventive wrapper eliminates coatings on iron and steel products. Slow vaporization of the chemical incorporated covers every surface of the ferrous metal and prevents all corrosive action.

BATTERY CHARGER—*Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio.* Type S single-circuit battery charger services batteries of industrial electric trucks. No manual attention is required during the charge.



STRAPPING MACHINE — *Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.* In power-strapping machine Type 3A encirclement with the correct amount of strap is automatic. The strap is tightened to a pre-set amount of tension, the seal is applied, and the strap is cut to complete the cycle.



MAGNETIC SEPARATOR — *Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee, Wis.* Automatic separation of magnetic and non-magnetic materials with an Alnico plate magnet has been achieved with the self-cleaning Perma Plate.

SCOTCH TAPE—*Minnesota Mining and Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.* A paper tape with a tensile strength of 180 lb per in. of width, No. 230 Scotch tape has thread-like fibers to reinforce the paper backing. It has a pressure-sensitive adhesive.

FILAMENT TAPE—*Minnesota Mining and Mfg. Co., St. Paul, Minn.* Scotch-brand filament tape is for heavy-duty packaging. With an acetate film backing instead of paper, this tape is waterproof, and is thinner than paper-backed filament tape.

STITCHER — *Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.* The Acme Morrison metal stitchers fasten metal to metal or to non-metallic materials such as rubber, wood, asbestos, or cloth. The stitch is formed from a continuous coil of steel wire.

CLINCHER — *Tomkins-Johnson Co., Jackson, Mich.* Underfeed clincher is available in a standard model with vertical anvil and anvil guide, and a special model with inclined anvil and anvil guide. Range of throat depths is 8 to 36 in. inclusive.

SWIVELS — *General Machine and Welding Works, Pomona, Calif.* Twisting and kinking of wire lines in strung hoisting blocks is prevented with Miller angular-thrust ball-bearing swivels.

PLATE CLAMP—*The Marboltt Weld Co., 4589 Martin Ave., Cleveland, Ohio.* Steel-plate clamp handles all plates of $\frac{1}{4}$ to 2 in. The clamp measures 9x12 in.

CASTER—*The Bassick Co., Bridgeport, Conn.* Forged-steel precision heavy-duty casters in 5-, 6- and 8-in. dia wheel sizes, utilize strength of forged-steel frame and top plate.

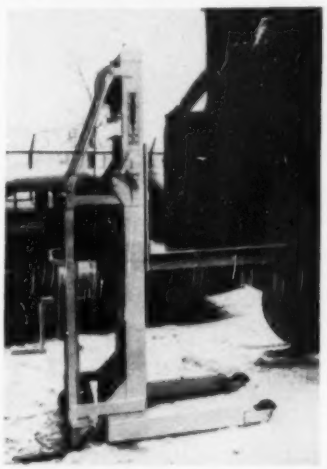
WHEELS—*Factory Service Co., 4633 N. 21st St., Milwaukee 9, Wis.* The Turner rubber-tired wheel fits on all mobile units of the Turner System of materials handling and are noiseless, sparkproof, and long-wearing.

WATER-TIGHT WHEEL—*Aero Co., Inc., Los Angeles 21, Calif.* Aero-Seal water-tight wheels are produced by a permanent mold process, and are said to undergo rigid inspection to insure dust-, air-, and waterproof qualities.

MAGNETOOL—*Multifinish Mfg. Co., 2114 Monroe, Dept. No. 304A, Detroit 7, Mich.* Improved Multi-lift rotary Magnetool is for steel pickup purposes.

LIFT—*Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.* Long, heavy crates, and bulky objects to 30-ft length are moved by this auxiliary lifting and rolling device.

PALLET CRANE—*Grand Specialties Co., 3135 W. Grand Ave., Chicago 22, Ill.* Grand portable pallet crane No. 40-PG can raise 16- x 24-in. pallets with up to 500-lb loads to a maximum height of 5 ft 6 in.



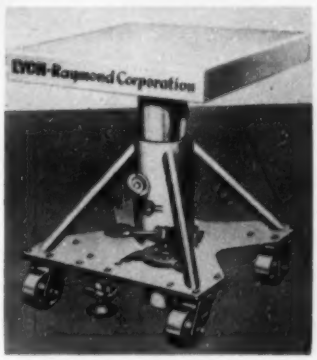
ELEVATORS — *Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.* Capacities of 500, 1000, and 2000 lb are offered in the Hundred line of Barrett hand-operated portable elevators.

DIE TABLE — *Lyon-Raymond Corp., 7267 Madison St., Greene, N. Y.* Dies can be transferred from a press having an extended base to a die-handling table with this hydraulic elevating table having an overhanging top.

DIE TABLE — *Lyon-Raymond Corp., 2644 Madison St., Greene, N. Y.* Special hydraulic die table has a 31- x 42-in. top equipped with 13 rollers set on 3-in. centers. Removable retaining bar prevents dies from rolling off the open end of the table.

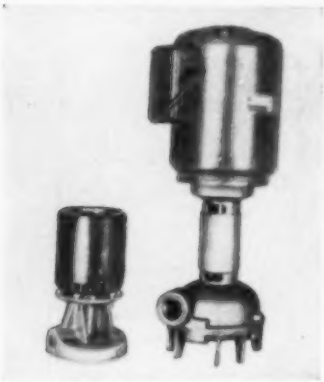
MOVABLE TABLE—*Alhambra Products Co., 822 Date St., Alhambra, Calif.* The Tote'em table is a three-tiered movable table made of 16- and 18-gage sheet steel, and used for moving tool supplies or for stockroom use.

ELEVATING TABLE—*The Hamilton Tool Co., Hanover at 9th, Hamilton, Ohio.* Held in place by a flange which encompasses the table perimeter, roller conveyor top facilitates movement of extra-heavy loads to and from the Portelevator elevating table.

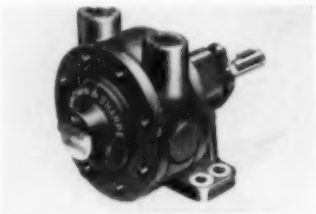


ELEVATING TABLE — *Lyon-Raymond Corp., 6698 Madison St., Greene, N. Y.* Hydraulic elevating table has a 30x30-in. revolving top. Lowered height is 28 in. and elevated height is 42 in.

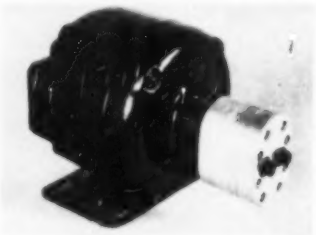
PLANT SERVICE EQUIPMENT — Pumps, Air Compressors



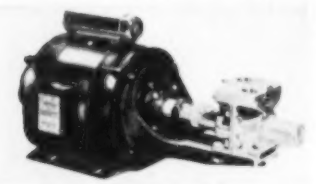
CENTRIFUGAL PUMPS — *Graymills Corp., 3006 Ridge Ave., Evanston, Ill.* Superflo centrifugal pumps and pumping units range in size from 1/25 hp to ½ hp. The pump capacities range from 3.4 gph to 70 gpm at a 10-ft head.



PUMPS—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Nine styles and sizes of these pumps are available as complete units, or as stripped models.

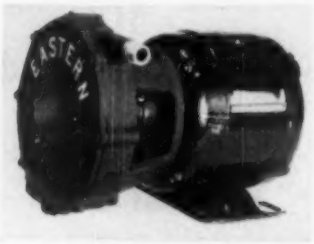


PUMP—*Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn.* Model 1304 is a gear pump equipped with an aluminum body, bronze gears, and cup seal. It pumps 1½ gpm at 200 psi.

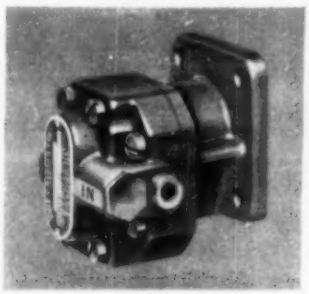


PUMP AND MOTOR UNITS — *Eco Engineering Co., 12 New York Ave., Newark 1, N. J.* Supplied in ⅛-, 1/3-, and ½-hp models, the close-coupled gearless-pump units are entirely supported by the motor base.

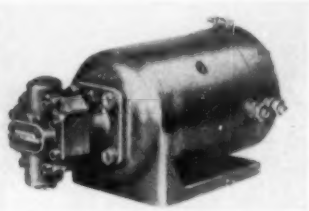
PUMP—*Worthington Pump & Machinery Corp., Harrison, N. J.* A mechanical seal and a self-lubricating inboard sleeve bearing to carry overhung drives are employed in the improved GAMI rotary-pump line.



CENTRIFUGAL PUMP—*Eastern Industries, Inc., 296 Elm Street, New Haven 6, Conn.* Model H centrifugal pump is designed for applications where moderate pressures and volumes are required from a pump running at 1725 rpm.

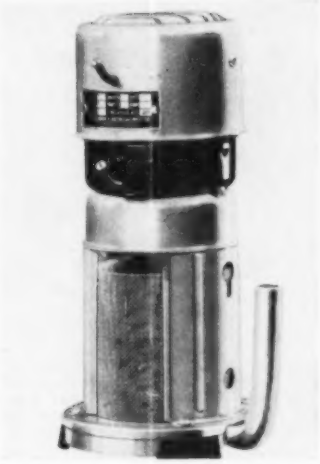


PUMPS—*John S. Barnes Corp., 106 Walnut St., Rockford, Ill.* High-pressure gear pumps maintain continuous pressures to 1000 psi and intermittent pressures to 1500 psi.

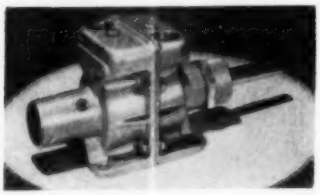


PUMP—*John S. Barnes Corp., Rockford, Ill.* Addition to the line of Constant-Flo rotary gear pump is a pump-and-motor unit with parts exactly mated to each other, assuring maximum efficiency.

HYDRAULIC PUMP—*Lyon-Raymond Corp., 4752 Madison St., Greene, N. Y.* Air-operated hydraulic pump is primarily for Lyon-Raymond equipment, but can be adapted to others.



RECIRCULATING PUMP — *Thermador Electrical Mfg. Co., Los Angeles 22, Calif.* Recirculating pump handles 7 2/3 gpm against a 2-ft head, or 2 2/3 gpm against a 10-ft head.



GEARLESS PUMP—*Eco Engineering Co., 12 New York Ave., Newark 1, N. J.* Gearless pump for industrial handling of liquids is of dual eccentric piston design giving a strong flow against pressure.

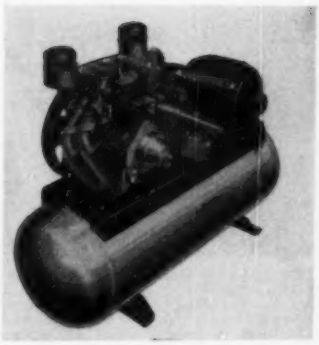
ROTARY PUMPS — *Worthington Pump & Machinery Corp., Harrison, N. J.* Inboard-bearing construction on the GR herringbone-gear rotary pumps takes load off main pump bearings.

AIR PUMPS—*Gast Mfg. Corp., Benton Harbor, Mich.* By producing a moderate vacuum and pressure with comparatively large air volume per hp, these air pumps meet requirements for feeding paper, cardboard, light metal, or plastic materials on printing presses.

SEPARATOR—*James A. Murphy & Co., 5th and Vine Sts., Hamilton, Ohio.* Compressed air separator removes the last trace of oil, moisture and dirt from compressed air at the point of use.

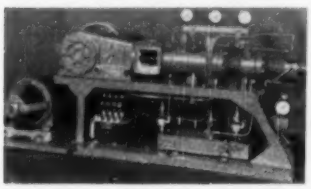
AFTER COOLER—*Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y.* Aero after cooler is of simplified construction and is protected from freezing in outdoor installations. The equipment dehydrates compressed air or gas.

COMPRESSOR—*The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.* A V-type, four-cylinder air compressor has a floating-type tank mount, and an enlarged and refined cooling system. The displacement of a 10-hp unit is 47.86 cfm at 175 psi.



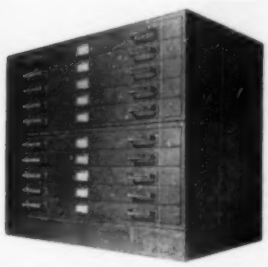
COMPRESSORS—*Wayne Pump Co., Fort Wayne 4, Ind.* Air compressors are offered in two sizes providing respectively 20 and 40 cu ft at 175-lb pressure and 37- and 50-cu ft displacement as low-pressure models (100 lb).

PRECISION LETTERING INSTRUMENT—*The Varigraph Co. Inc., 2715 Vine St., Lincoln 3, Nebr.* The Varigraph, by dial adjustment, can achieve more than 500 variations from one templet. Templets are available in sixteen popular alphabets.



COMPRESSOR — *Norwalk Co., Inc., South Norwalk, Conn.* Pressures up to 6000 psi with displacement of 1 to 3 cfm are produced by this 4-stage Norwalk compressor.

LAYOUT INK—*Protective Coatings Corp., Northwest Highway, Des Plaines, Ill.* Kempro design layout ink is packed in a 12-oz can under pressure and is sprayed on the layout surface by pressing a button.

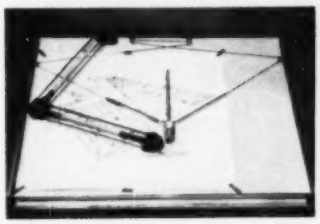


BLUEPRINT CABINET — *Cole Steel Equipment Co., 285 Madison Ave., New York, N. Y.* Blueprint cabinet of heavy-gage furniture steel contains five gliding drawers on ball-bearing rollers, and five drawer units securely stacked to meet individual requirements.

INTERMEDIATE PAPERS—*Technifax Corp., Holyoke, Mass.* Plastic-surfaced intermediate papers and cloth for whiteprint machines called Tecnilith and Technicloth are available in both sepia-line and black-line formulations.

WHITEPRINTING MACHINE — *The C. F. Pease Co., Chicago, Ill.* Ammonia-vapor whiteprints are developed continuously in cut sheets or from rolls at speeds ranging to 32 fpm in the Pease Pacemaker. Completely automatic, this machine reproduces tracings, drawings, foil, film, or anything typed, written, or drawn on reasonably translucent paper.

WHITEPRINTING MACHINE — *Charles Bruning Co. Inc., 4754 Montrose Ave., Chicago 41, Ill.* Model 50 whiteprinting machine has variable printing speeds up to 24 ft per min, and under actual working conditions can produce 10,000 sq ft of prints a day.



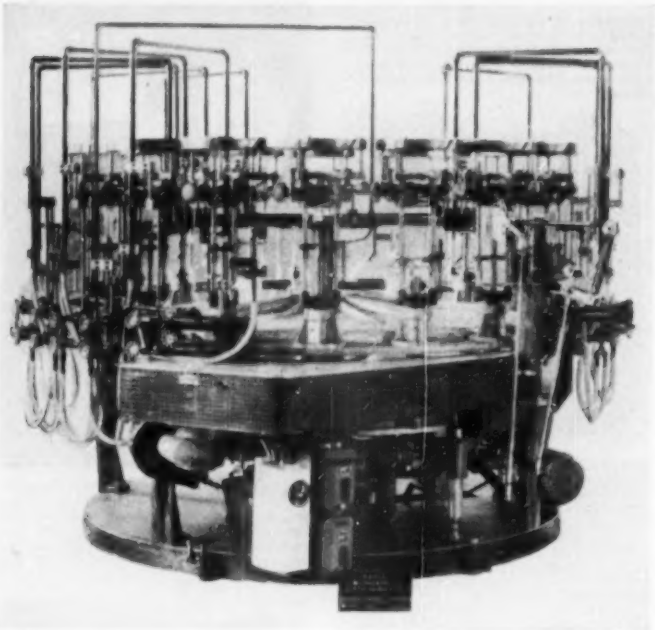
DRAWING INSTRUMENT — *Charles Bruning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.* Draftsman's instrument for perspective drawings automatically guides the draftsman's pencil toward the established vanishing point from any position upon the drawing board.

FILING CABINET—*Empire Development Corp., 807 Union Trust Bldg., Washington, D. C.* The Draw-In-Dex cabinet accommodates 1000 prints, any of which can be immediately removed or replaced without disturbing the others. It is 20x30 in., and 4 ft high.

DRAFTER — *Charles Bruning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.* New drafter mechanism which overcomes gravity is said to combine all the functions of T-square, straightedge, triangles, protractors, and scales.

WHITEPRINTER—*Charles Bruning Co., 4754 W. Montrose Ave., Chicago 41, Ill.* A large-volume Whiteprinter has an output of 105 sq ft per min. This machine reproduces anything recorded upon translucent mediums.

PLANT SERVICE EQUIPMENT—Miscellaneous



ELECTRON TUBE MACHINE — *Kahle Engineering Co., 1309 Seventh St., North Bergen, N. J.* Electron-tube machine seals cathode tubes. Shrinkage is held at a minimum.

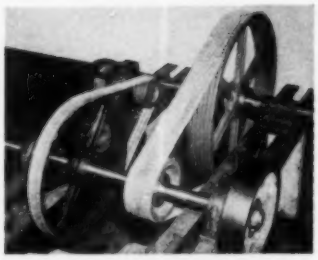
WASTE CONTAINERS — *The Protectoseal Co., 1920 South Western Ave., Chicago 8, Ill.* Any 30- or 55-gal drum can be quickly converted to a fire-safe waste container by means of the Protectoseal self-closing drum cover.

FIRE EXTINGUISHER—*American-LaFrance-Foamite Corp., Elmira, N. Y.* The Alfco dry-chemical fire extinguisher employs a dry chemical which is nontoxic, noncorrosive, a nonconductor of electricity, and will not freeze.

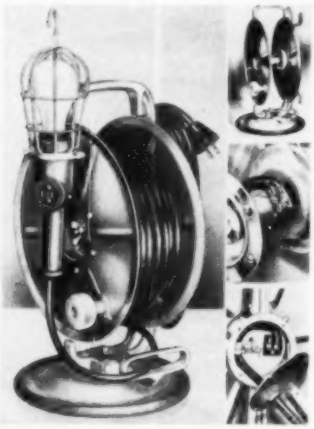
GOGGLE — *Willson Products, Inc., Reading, Pa.* Less weight and greater strength are obtained in this welding goggle by the use of nylon plastic cups.

MAINTENANCE TOWER — *Safway Steel Products, Inc., Milwaukee 13, Wis.* Rolling maintenance tower is raised hydraulically and operated manually by one person from a work platform. Safety brakes lock wheels to hold lift tower in desired working position.

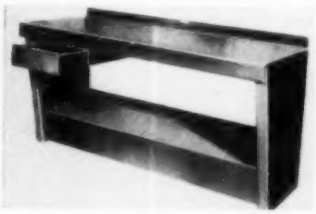
GOGGLES—*The Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.* Cup-type goggles have molded thermoplastic cups, engineered to fit left- and right-eye areas snugly yet gently.



BELTING—*Worthington Pump & Machinery Corp., P. O. Box 955, Buffalo 5, N. Y.* Vee Ply belting, designed to service emergency breakdowns and eliminate a large endless-belt inventory, can be adapted to most V-belt drive applications.



CORD REEL — *Industrial Electrical Works, Omaha, Nebr.* Port-O-Reel weighs 9 lb without cord, stands 17¾ in. high and is said to eliminate most of the wear ordinarily sustained on electric cords.



WORKBENCH — *Equipto, Div. of Aurora Equipment Co., Aurora, Ill.* Streamlined work bench has a 12-gage steel top and is made for heaviest industrial and automotive uses. Size is 6 ft long by 34 in. high and 23 in. deep.

FACESHIELD—*Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.* The MSA Deluxe faceshield consists of a 19x9-in. visor of nonflammable vinyl plastic which extends completely around the face covering ears and extending below the chin.

SAFETY SPECTACLES — *United States Safety Service Co., Kansas City 6, Mo.* Made from "Optilite," optical safety plastic, one-piece lens of the "Saf-I-Spec" can be replaced or adjusted instantly.

FILTER MASK — *The Goggle Parts Co., Inc., Cleveland 13, Ohio.* Flex-a-Foam filter mask features lightness, exceptional toughness, and toxic-free purity.

CHIPPERS' GOGGLE—*American Optical Co., Southbridge, Mass.* Chippers' goggle is compression-molded of a strong and durable phenolic compound and features dome-metal side screens.

SAFETY GOGGLES — *Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.* For buffing, polishing, light assembly, and spot welding, the Coverlite goggle is available in clear, light green, or dark transparent frames.

FIRE EXTINGUISHER — *C-O-Two Fire Equipment Co., P. O. Box 390, Newark 1, N. J.* C-O-Two dry-chemical fire extinguisher is a self-contained unit. It is free flowing and has no syphon tubes or valves within the cylinder.

RUBBER GLOVE — *B. F. Goodrich Co., Akron, Ohio.* Made to permit a sandpaper grip on slippery objects and still retain finger sensitivity, this industrial rubber glove is 11 in. long, and is made in sizes of 7½ to 11, in russet.

EYE PROTECTION — *Willson Products, Inc., Reading, Pa.* Called Mono-Goggles, eye protections are made of a one-piece plastic lens. Low heat transmission of the lens retards fogging.

SMOKE DETECTOR—*Walter Kidde & Co., 40 East 34th St., New York 16, N. Y.* A control cabinet and an analyzer tube are the two main units comprising the Kidde multi-space smoke detector. When 3% or more smoke is present in the air sample an alarm rings and the indicator tells the exact location from which the smoky sample came.

MATS AND RUNNERS — *The Atlas Sponge Rubber Co., 806 E. 61st St., Los Angeles 1, Calif.* Mats and runners are made of resilient sponge rubber, ½ in. thick by 21½ x 47 in., with beveled edges; also a size of ½ x 21½ x 23 in.

GOGGLES — *Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.* Spectacle-type goggles are equipped with the Comfort Bridge. The jumbo pads plus balanced suspension frame distribute the light weight of the goggle evenly across the nose.

GOGGLES—*American Optical Co., Southbridge, Mass.* Rubber cushions are now available for the Panoram goggle to provide extra wearing comfort.

GLOVE—*Belle City Glove Co., 112 E. Chestnut Street, Chicago 11, Ill.* A plastic-coated and impregnated safety glove, with a cotton-fabric base, is claimed to give up to 10 times the wear normally expected of neoprene-coated gloves.

COTTON GLOVE—*The Milburn Co., 3246 E. Woodbridge St., Detroit 7, Mich.* Coated cotton work glove, called the Ply-Garb, will not crack or peel and does not become slippery when immersed in oil, water, or solvents.

SMOKE DETECTOR—*Walter Kidde & Co., Inc., 40 East 34th St., New York 16, N. Y.* Single-unit photoelectric smoke indicator is for early detection of incipient fires in hazardous plant and warehouse areas. A continuous sample of air is drawn from the protected space.

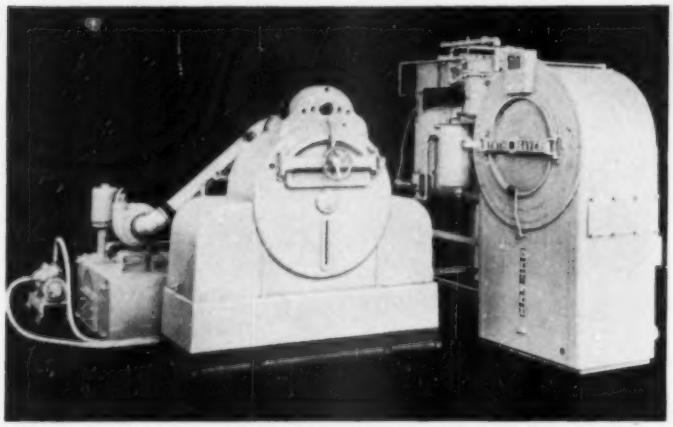
FIRE EXTINGISHERS—*Fyr-Fyter Co., Dayton, Ohio.* Fire extinguishers are made of stainless steel instead of copper for both the 2½-gal. soda-acid type and the 2½-gal. foam type. They are five pounds lighter, making the extinguisher easier to lift and operate.

FIRE EXTINGUISHERS—*American-La France Foamite Corp., Elmira, N. Y.* Available in foam, soda-acid, and anti-freeze water types, these American-La France 2½-gal. silicon-bronze fire extinguishers have an ultimate shell strength of 14,000 psi.

PHOTOELECTRIC SMOKE INDICATOR UNIT—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* Type A20C-1 indicates the density of smoke passing through the flue or breaching of a heating or power plant, and signals when this density approaches the values prescribed by municipal smoke ordinances.

FIRE EXTINGUISHER—*Stop-Fire, Inc., 125 Ashland Place, Brooklyn 1, N. Y.* Automatic-sprinkler portable-system fire extinguisher is equipped with a sprinkler head which discharges under pressure a wide fast-moving spray of combined carbon dioxide and atomized Chlorobromomethane.

GLOVE—*American Optical Co., Southbridge, Mass.* Heavy-duty glove for handling small castings, rough stock, grinding, and similar work is made of treated chrome-tanned cowhide and has a canvas back with an elastic strap to overcome hand fatigue.



DRY-CLEANING UNITS — *Detrex Corp., Box 501, Detroit 32, Mich.* Wiping rags and other shop garments get the full treatment in these Detrex industrial dry-cleaning units. With a capacity for 100 to 140 lb per hr, soiled weight, these units require 12 ft x 10 ft 6-in. floor space.

SLIDE RULE—*Pickett & Eckel, Inc., 5 S. Wabash, Chicago 3, Ill.* With optical tongues and grooves machined to 0.001-in. accuracy, the 6-in. Model 300 log log duplex slide rule has a magnesium-alloy body. C-D scales on both sides of the rule, together with folded and reverse scales, speeds figuring and avoids going off-scale.

AIR CLEANERS — *Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.* Westinghouse Precipitron cubicles are designed for use in multiples, the number of units depending upon the volume of air to be cleaned.

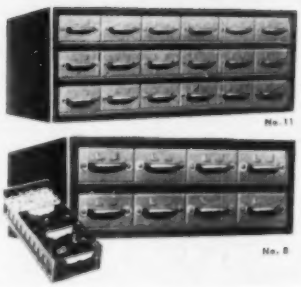
FLUORESCENT COLOR — *Duro-Test Corp., North Bergen, N. J.* The Vis-A-Ray fluorescent color is said to heighten detail perception. The color concentrates its rays in the spectral range which is easiest on the eyes.

INFRA-RED UNITS — *The Miskella Infra-Red Co., East 73rd and Grand Ave., Cleveland 4, Ohio.* Insulated Spir-O-Therm lampless units bake, dry, preheat, carbonize, and dehydrate. Diagonal positioning eliminates hot spots and hot streaks.

VIBRATION ABSORBANT—*Western Felt Works, Chicago, Ill.* Westsorb eliminates vibration on all types of machinery. It does away with floor bolts to anchor machines.

LIGHT—*The McGill Mfg. Co., Inc., Electrical Div., Valparaiso, Ind.* Portable service light offers an outlet built into the molded Bakelite handle, which serves as a convenient plug for power tools, soldering irons, or additional lights.

SLIDE RULE—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Measuring 3 x 6½ in., this slide rule calculator determines the force required for broaching any part whether of cast iron, various types of steels, bronze, aluminum, magnesium, or plastics.



DRAWER CABINETS—*Equipto, Div. of Aurora Equipment Co., Aurora, Ill.* Two strong low-priced steel-drawer cabinets are for nuts, bolts, washers, screws and other small parts. They can be used singly, side by side, or stacked on top of each other.

ELECTRODE STEAM GENERATORS—*Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.* These boilers are available in three pressure ranges: Series No. 512-100 psig, No. 612-200 psig, and No. 712-250 psig. Operating on 220 volts, single-phase power, the units generate 45 lb per hr.

TRANSFER UNIT—*J. N. Fauver Co., 49 W. Hancock Ave., Detroit 1, Mich.* This portable transfer unit can be used for filtration of fluids. Model illustrated has a 20-gpm capacity.

SERVICE LIGHT — *McGill Mfg. Co., Inc., Valparaiso, Ind.* The No. 505 all-purpose light employs a concentrating lens which multiplies useful light, and a universal mounting which permits aiming the light where it is most needed.

SCRAP CHOPPERS — *Durant Tool Supply Co., 155 Orange St., Providence 3, R. I.* Durant Model 400 automatic scrap chopper is a heavy-duty machine for handling material up to 6 in. wide and ¼ in. thick as it comes from the punch press.

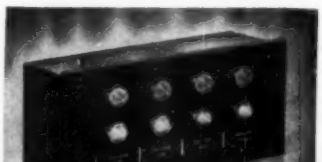
LIGHTING FIXTURE—*Stocker and Yale, Marblehead, Mass.* Model 10 fluorescent lighting fixture provides an intense but cool and glare-free illumination for critical work areas. Fixtures operate on 115 v, 60 cycles, 220 v, 60 cycles, 220 v, 50 cycles, and 110 v dc.

SLIDE RULE WRIST WATCH — *Juvenia Watch Agency, Inc., 604 Fifth Ave., New York, N. Y.* The Arithmo calculating wrist watch features an accurate precision slide rule built around the dial.

MAGNETIC SEPARATOR — *Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee, Wis.* Constructed for installation at the discharge end of chutes, spouts, and conveyors, permanent-drum non-electric alnico magnetic separators are equipped with adjustable dual-purpose leveler and burden feed control.

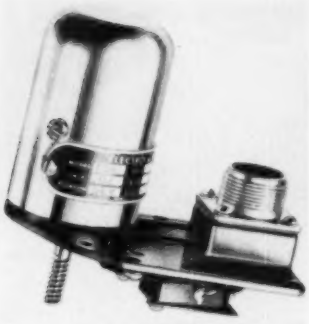
DECIMAL CALCULATIONS — *United Tool Service Corp., 3450 W. Harrison St., Chicago 24, Ill.* Paper work is eliminated in the addition and subtraction of decimals and fractions by use of this Neighbors Rule.

SPECIAL MACHINES—*Trio Tool Co., Detroit, Mich.* In connecting rod assembly machine, (right) connecting-rod bolts and nuts, carried in right and left hoppers, are assembled with the connecting rod and cap. Disassembly machine (left) loosens nuts so that they can be removed by hand.

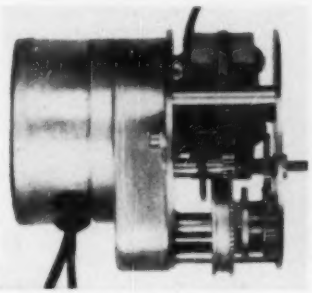


MULTIPLE-SIGNAL SYSTEM—*Panalarm Products, Inc., 7218 North Clark St., Chicago 26, Ill.* Panalarms are multiple-signal and alarm systems for applications where sound and visual alarms are required, to indicate failure or changes off normal.

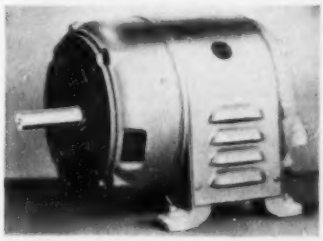
Parts and Materials



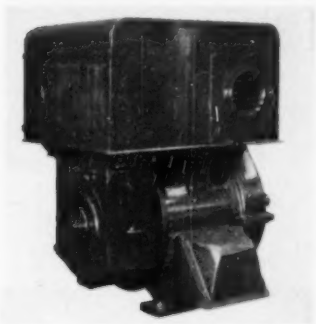
DC MOTOR—*Electro-Aire, Inc., 11439 Vanowen St., North Hollywood, Calif.* Running torque of this 1/100-hp dc motor is listed at 1 in.-oz at 10,000 rpm, 28-volts dc, but motor is said to be adaptable to many other torque and speed requirements.



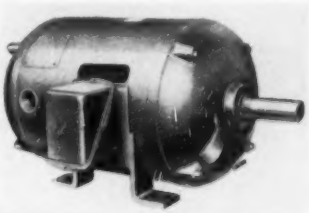
MOTOR UNIT — *R. W. Cramer Co., Inc., Centerbrook, Conn.* The SXC synchronous motor and differential-clutch mechanism is designed to meet the needs of timing, recording, indicating, and switching applications requiring an accurate reset operation. The motor produces 30-in.-oz torque at 1 rpm.



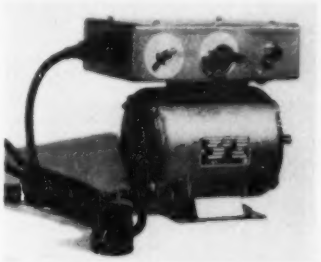
MOTORS — *U. S. Electrical Motors, Inc., Los Angeles 54, Calif., and Milford, Conn.* Electric Unimount motors, especially designed for direct connection to driven machinery, are adaptable to pumps, compressors, mixers, machine tools, blowers, woodworking machines, and grinders.



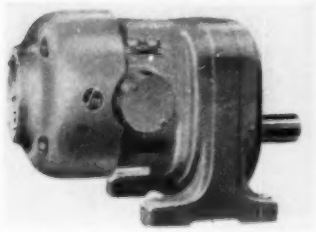
DC MOTORS—*General Electric, Schenectady 5, N. Y.* Unit-cooled dc motors with new cooling assemblies can operate at slow speeds for long periods of time.



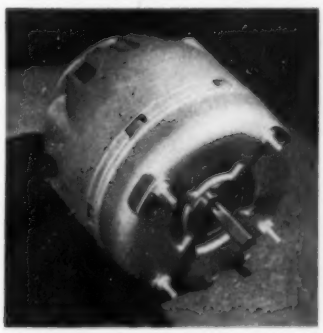
ELECTRIC MOTORS—*The Crocker-Wheeler Electric Mfg. Co., Div. of Joshua Hendy Corp., Ampere, N. J.* Protected wound-round motors are for applications requiring smooth acceleration, high starting torque with low-starting current.



SYNCHRONOUS MOTOR—*Electric Indicator Co., Stamford, Conn.* Elinco Model GH-371, a three-speed Hysteresis-type synchronous motor, is rated at 1/100, 1/60, and 1/40 hp, respectively, at 900, 1800, and 3600 rpm.



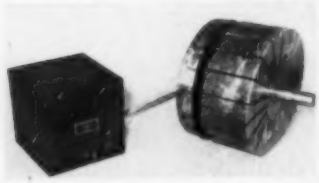
MOTOR — *Sterling Electric Motors, Inc., Los Angeles, Calif.* The Sterling "Slo-Speed," "Klosd-Tite" motor Type FWFB is totally inclosed, lubricated for life, and has labyrinth seals, liberal heavy-duty ball bearings, and sterling herringbone rotor.



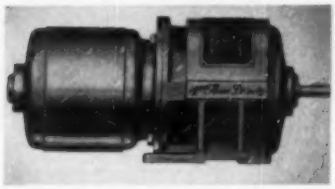
MOTORS—*The General Electric Co., Schenectady 5, N. Y.* A line of unit-bearing, shaded-pole friction-horsepower motors are for use on portable equipment and can be used for horizontal or vertical shaft operation.

GEARHEAD MOTOR — *Robbins & Myers, Inc., Springfield, Ohio.* Basically a standard motor with self-contained gear-reduction mechanism, this gearhead motor is available for single- and double-reduction requirements in ratings from 1/200 to 1/3 hp.

CAPACITOR MOTORS — *General Electric Co., Schenectady 5, New York.* Capacitors are mounted in the base of the Tri-Clad, single-phase electric motor to minimize over-all dimensions. The conduit box has been replaced by a built-in terminal board inside the end shield for easier wiring.



POWER UNIT — *Black & Webster Inc., Needham, Mass.* For applications similar to those of air and hydraulic cylinders the Electrothrust electric-power unit is capable of applying several tons force for operations requiring pressure, impact, or impact followed by pressure.



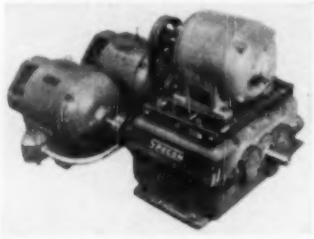
POWER UNITS—*The American Blower Corp., Detroit 32, Mich.* Hydraulic-electric power units with built-in Gyrol fluid drive are offered in sizes ranging from 1 through 20 hp.

INDUCTION MOTORS—*Electric Machinery Mfg. Co., Minneapolis 13, Minn.* Design "X" extra-low kva, across-the-line squirrel-cage induction motors, are for direct connection to air compressors operating at 720, 600, and 514 rpm, permitting across-the-line starting with a starting kva.

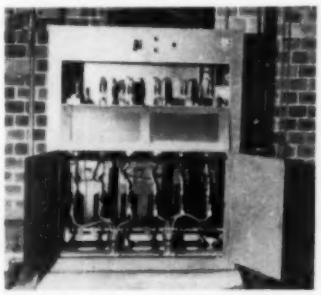
SPEED CONTROL—*Servo-Tek Products Co., 4 Godwin Ave., Paterson 1, N. J.* Stepless speed control is for fractional horsepower motors. A simplified circuit makes possible an electronic control system without sacrificing desirable operating features.

MOTOR CONTROL — *The Brown-Brockmeyer Co., Dayton, Ohio.* Remote stepless speed adjustment and control for frictional-hp motors are obtained with the Dyna-Speed electronic motor-control unit.

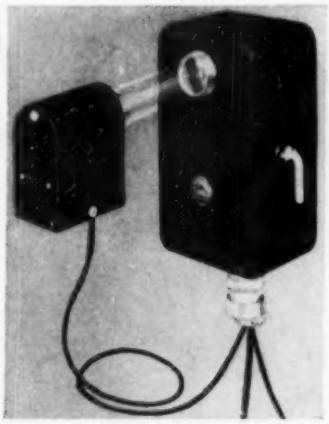
SPEED DRIVE—*Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.* Westinghouse Mot-O-Trol packaged adjustable-speed drive starts motors, brings them up to preset speeds, permits change of speed at any time, applies dynamic breaking for stopping, and reverses motors.



SPEED DRIVE—*Speed Control Inc., 1334 Depot St., Wickliffe, Ohio.* The Specon ED electrical differential speed drive consists of a standard ac squirrel-cage motor, coupled with two dc motors through a differential gear box. The unit gives infinite speed ranges with constant torque.



SPEED-CONTROL UNIT—*Electron Equipment Corp., South Pasadena, Calif.* Electronic automatic speed-control unit, for machinery prime movers, is essentially a simplified system for utilizing flexible performance characteristics of dc motors, but operating from an ac power source.



PHOTOELECTRIC CONTROL—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* Jamming of cases or cartons on conveyor lines is prevented by the recently developed Photoswitch delayed-action photoelectric control.

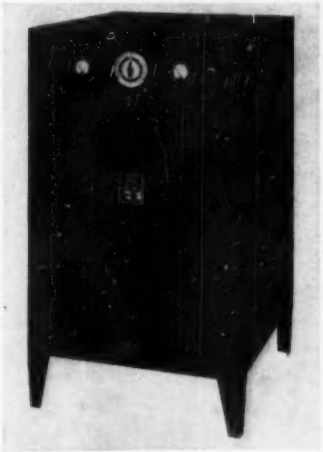
SPEED CONTROL — *General Radio Co., 275 Massachusetts Ave., Cambridge 39, Mass.* Operating a 1/3-hp dc shunt motor from an ac line is simplified by use of this low-power, compact, single-unit speed control.

DRIVE—*General Electric Co., Control Division, Schenectady 5, N. Y.* A low-cost Thy-mo-trol drive, type H1, utilizes a simplified half-wave circuit to provide dc flexibility from ac power. It is furnished in ratings through ½ hp.

MOTORS—*The Ruthman Machinery Co., Cincinnati 2, Ohio.* Explosion-proof polyphase motor is available in sizes ¼, ½, and ¾ hp for any Gusher pump within this horsepower range.

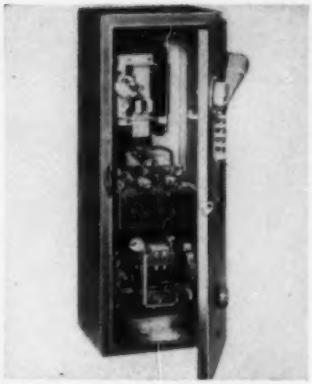
START-STOP CONTROL—*DV Welding Controls, Oakland 11, Calif.* DV automatic start-stop control for electric dc welders enables the operator to start welder by striking an arc without having to leave work.

ALTERNATORS — *The Kato Engineering Co., Mankato, Minn.* Alternator permits a capacity of 300 kw, at 1800 rpm, 60 cycles, and is available at speeds of 720, 900, 1200 and 1800 rpm.

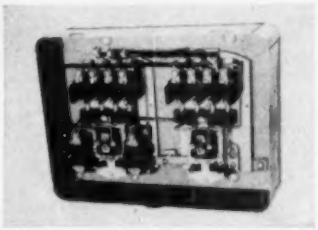


SELENIUM RECTIFIERS—*Fansteel Metallurgical Corp., N. Chicago, Ill.* Selenium rectifiers charge 15, 16, or 18 cells of lead battery or 20 to 24 cells of Edison battery. Operation is automatic.

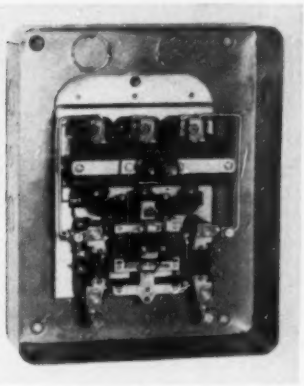
STARTERS—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 3151 Size 0 and 1 ac manual across-the-line starters operate with single or polyphase ac motors. Mechanically actuated quick-make-and-break switch mechanism is thermal-overload protected.



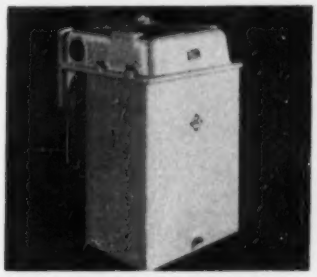
POLYPHASE-MOTOR STARTER — *Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.* A circuit-breaker operating mechanism in this starter for polyphase motors is said to assure maximum operator safety. An interlock prevents opening the door when breaker is on.



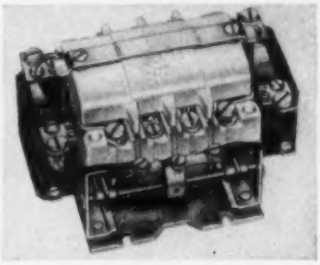
STARTERS—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Line of ac magnetic reversing starters is designed for industrial-control applications. Starters with three poles are available for across-the-line starting.



MAGNETIC STARTERS — *Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 4113 size 3 ac solenoid-operated starters are for general- and special-purpose applications where across-the-line, non-reversing starting of polyphase squirrel-cage induction motors and single-phase motors is permissible.



STARTER — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* Wall-mounted full-voltage starter Type 371, is especially adaptable for use where corrosive vapors or combustible dust-laden atmospheres are present.

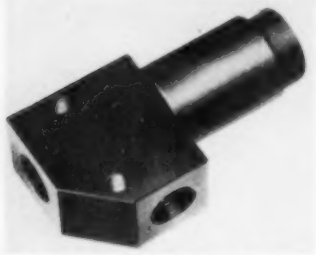


MAGNETIC STARTERS — *Arrow-Hart & Hegeman Electric Co., Hartford, Conn.* Plaskon Alkyd, a thermosetting industrial molding compound, is being used in molded bases and protective hoods.

MAGNETIC STARTERS — *General Electric Co., Schenectady 5, N. Y.* Designed for starting and protecting motors up to 50 hp, the new full-voltage ac starters are furnished in all NEMA sizes from 0 to 3. The contactors come in NEMA sizes from 00 through 3.

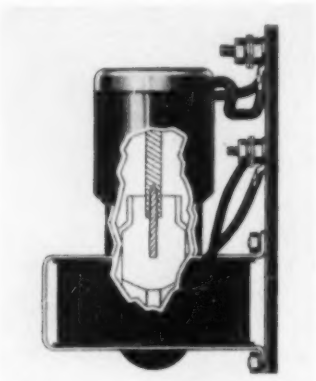
MOTOR STARTER—*Allis-Chalmers Mfg. Co., South 70th St., Milwaukee, Wis.* The RMC manually-operated reduced-voltage auto-transformer motor starter can be used with two-phase, three-wire, or three-phase machines where reduced-voltage starting and manual control are desired.

BUS—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* One-split bus design for feed-in duct reduces voltage drop in the distribution of power over long distances.



SOLENOID-OPERATED VALVE—*Carma Mfg. Co., 2401 E. 103rd St., Los Angeles 2, Calif.* Model 10041, for air or fluids, is a normally closed, two-way valve, designed for continuous duty at ambient temperatures between —65 and +200 F. handling air or fluids at pressures up to 12 psi.

SOLENOID VALVE — *Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.* Air pressures of from 0 to 125 psi can be handled by this single-solenoid valve. Sizes available are ¼-, ⅜-, and ½-in. spring return.

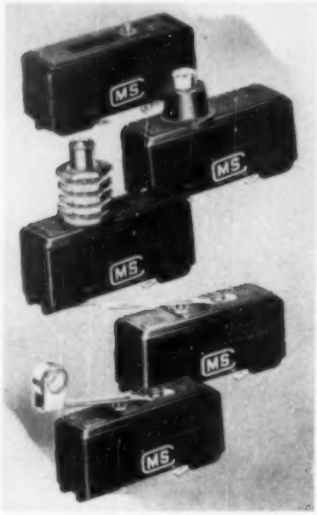


RELAYS — *Durakool, Inc., Elkhart, Ind.* Improved hydrogen arc-quenched mercury-type relays operate on the double-flow principle. Time relays are available at specifications from 0.15 sec to 20 sec.

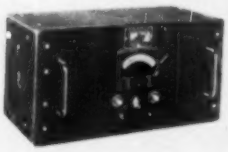
SWITCH—*Micro Switch Div., Freeport, Ill.* The BAF1-2RN switch designed for severe service in industrial use is a rugged, inclosed switch that combines high electrical rating with high inrush capacity.

LINEAR ACTUATOR—*Airborne Accessories Corp., 25 Montgomery St., Hillside 5, N. J.* The "Lineator" is an electrically operated linear actuator or motorized screw jack for imparting straight-line force in either tension or compression.

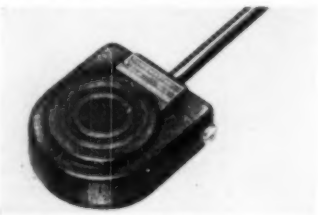
SOLENOID-OPERATED VALVE — *Oil-Rite Corp., 3486 South 13th St., Milwaukee 7, Wis.* Individual bearings to be lubricated are oiled from a reservoir by a solenoid-operated valve. Process is automatic.



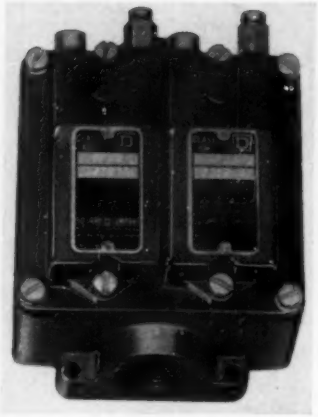
SWITCHES—*Micro Switch, Freeport, Ill.* High-capacity precision switches, type A, are for a steady state current rating of 20-amp, 125-, 250-, or 460-v ac; motor-load rating of ⅔ hp, 115-v, 1½-hp, 230-v ac; and a lamp-load rating of 10-amp, 125-v ac.



VOLTAGE REGULATOR — *The Superior Electric Co., 79 Hannon Ave., Bristol, Conn.* Rated at 2-kva output, automatic voltage regulator is electromechanical in operation and consists of a Super Electric Powerstat variable transformer controlled by a specially designed electronic detector.



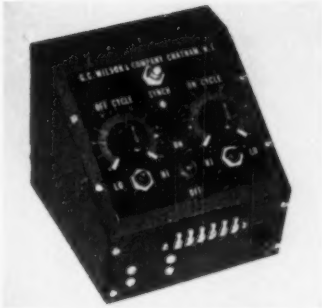
SWITCH—*Simonds Machine Co. Inc., Southbridge, Mass.* Mechanism can be operated by foot, finger, knee, or elbow. The Linemaster compact switch is made of heavy-gage steel.



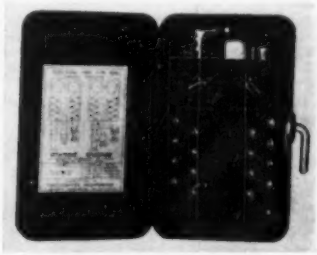
DUPLEX LIMIT SWITCHES—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Single duplex switch can be used to replace two separate limit switches on present machines or equipment. Switches are rated at 700 volts ac or dc, and will operate at temperatures to 200 F.

PRECISION SWITCH—*Micro Switch, Freeport, Ill.* Containing a single-pole double-throw circuit, the Micro Switch heavy-duty splash-proof precision switch is especially advantageous on equipment where operator safety demands two-hand control switches.

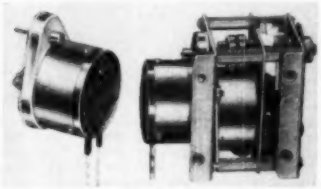
PRECISION SWITCH—*Micro Switch, Freeport, Ill.* The Micro-Limit precision switch is encased in a die-cast metal housing which provides unusual protection for the inclosed unit.



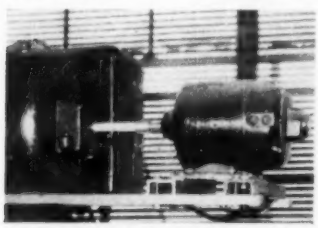
REPEAT-CYCLE TIMER—*G. C. Wilson & Co., 2 N. Passaic Ave., Chatham, N. J.* Repeat-cycle timer is an electronic device employing one vacuum tube. Time intervals are on, 0.2 to 200 sec; off, 0.1 to 60 sec.



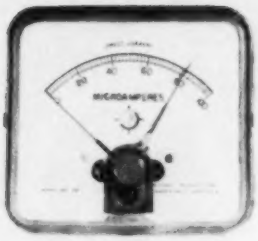
TIMER—*Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.* Type 30HL1 is an electronic automatic timer for intervals from 1/20 sec to 4 min.



DC TIMERS—*The Haydon Mfg. Co. Inc., Torrington, Conn.* The 9200 series dc motor is a low-voltage permanent-magnet type and can be built to industrial, Army, or Navy specifications. The basic motor has a speed of 900 rpm at 6v, dc.



TACHOMETER GENERATOR—*General Electric Co., Schenectady 5, New York.* Totally inclosed and equipped with rubber-mounted ball bearings and an Alnico permanent-magnet field, this dc tachometer-generator is designed for heavy-duty operation.



CONTACT METER—*Assembly Products, Inc., Chagrin Falls, Ohio.* Meter relay is offered for control applications. Positive contact on changes in current or voltage of as little as ½ microamp or a fraction of millivolt is claimed.

WATTMETER — *General Electric's Meter and Instrument Div., Schenectady 5, N. Y.* Single-phase combination watt-hr and thermal-watt-demand meter can be installed wherever rate structures require the determination of demand as well as energy.

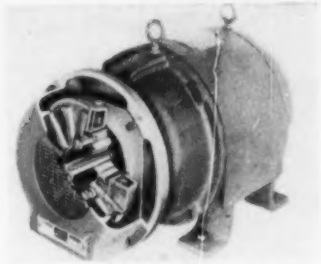
CONTROL COMBINATION—*Weltronic Co., 19420 W. 8 Mile Road, Detroit 19, Mich.* Model 106-53BA1 utilizers the NEMA 1A timer, plus a high-speed magnetic contactor and is for small welders for mounting to right-hand side.

RELAYS—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 103 Aircraft power relays are magnetically operated and are suitable for remote- and automatic-control purposes where conditions of vibration and shock are encountered.

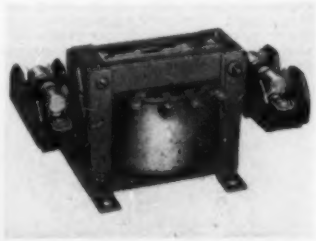
CIRCUIT INTERRUPTERS—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* Circuit interrupters, available in cast-iron inclosures, include weatherproof, dust-tight, dust-resisting, and explosion-resisting types.

THERMOSTAT — *George Ulanet Co., 410 Market St., Newark 5, N. J.* Measuring 1x5/16x¼ in., this totally enclosed thermostat has an electrical capacity of 100 watts ac at 115 volts. It can be furnished with normally opened or normally closed electrolytic-silver contacts.

TUBING—*Precision Paper Tube Co., 2045 W Charleston St., Chicago 47, Ill.* Designed as a heat-resisting base for electric coils and bobbins, this asbestos tube is unaffected by high temperatures.



ELECTRIC BRAKE — *The Warner Electric Brake Co., Beloit, Wis.* The Warner ICB electric brake is designed for mounting to standard NEMA "C" flanges. It requires 25-35 watts dc for full application.



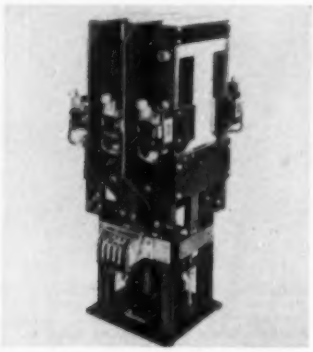
TRANSFORMERS — *Industrial Controller Div., Square D Co., 4041 North Richards St., Milwaukee 12, Wis.* Control transformers are specifically for use with industrial-control equipment characterized by high, momentary inrush currents to the ac-operating magnet coils.

VOLTAGE REGULATOR—*The Superior Electric Co., 79 Hannon Ave., Bristol, Conn.* Stabiline Type IE51005 is a 500-va instantaneous electronic voltage regulator. Input voltage range is given as 95-135 v. Output voltage range is adjustable from 110 to 120 v.

GROUND CONTACT—*Luma Electric Equipment Co., Toledo 1, Ohio.* SC-GA Luma magnetic ground contact for Etch-tools has a strong long-lasting magnet which securely holds the ground contact to the work.

REMOTE CONTROL SYSTEM—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* A low-voltage control system is for the remote control of lighting and appliance circuits.

POLARITY CAP—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* This magnetic-type polarity cap for a voltage tester is made of transparent plastic and screws on top of the tester.



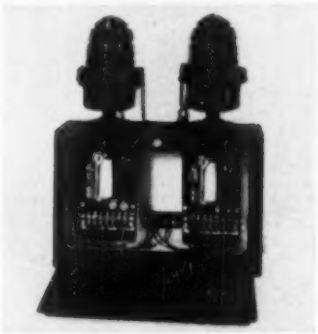
AIR-BRAKE CONTACTOR — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* Fifteen inches wide, 25 in. deep and 38 in. high, Type 256 high-voltage air-brake contactor has double-break contacts which halve the arc voltage and double the rate of dielectric recovery.

POWER RELAYS—*American Relay & Controls, Inc., 4925 W. Flournoy St., Chicago 44, Ill.* Type "DO" power relays are available in contact combinations up to 4-pole, double-throw. These units are 2¼ in. high, 2 1/16 in. wide and 1⅞ in. deep.

RHEOSTAT — *General Electric Co., Schenectady 5, New York.* Plate rheostat is for field control of dc shunt or compound motors, self-excited generators, exciters, separately excited generators, and synchronous motors.

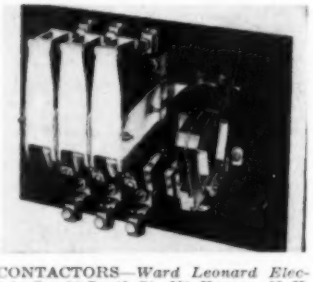
STABILIZING MECHANISM — *General Electric Co., Schenectady 5, N. Y.* Designed for GE frictional-hp motors in portable electric tools, this brush-stabilizing mechanism counteracts the wedging effect of commutator and causes brush to ride freely in the brush holder.

CIRCUIT BREAKER—*Square D Co., 6060 Rivard Street, Detroit 11, Mich.* This compact 50-amp, 600-v and 100-amp 250-v circuit breaker includes all construction features of the smaller ML and larger ML-2, ML-3 and WL breakers but is 50% smaller than the previous unit for this capacity.



LIGHT SIGNAL—*Pratt & Whitney, Div., Niles-Bement-Pond Co., Hartford, Conn.* A self-contained light signal device to be used with the P&W Model D Electro-limit continuous gage or "flying mike" signals the operator of a rolling-mill continuous-inspection line or a shear by means of light when the strip material is "off gage."

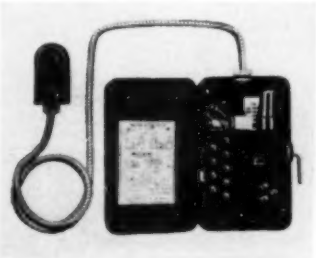
CONTROL SYSTEM — *Transicoil Corp., 114 W. Worth St., New York 13, N. Y.* Plate-to-plate operation now makes possible an important saving of weight and space in industrial and military control systems. Motor-stall torque ranges from 0.25 in.-oz up to 4.25 in.-oz.



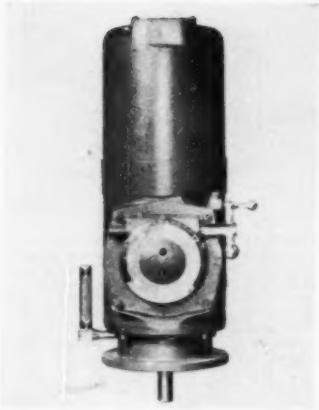
CONTACTORS—*Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.* Bulletin 4454 size 4 and Bulletin 4455 size 5, ac magnetic contactors are for motor, heater, and lamp control purposes. The 150- and 350-amp ac contactors offer movable and stationary contacts on both sizes which are identical and interchangeable.

POWER SUPPLY—*W. Green Electric Co. Inc., 134 Cedar Street, New York 6, N. Y.* High-amperage electroplating rectifiers are designed for operation from 220- or 440-volt, 3-phase ac.

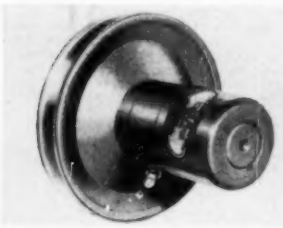
PANELETTE — *Square D Co., 6060 Rivard St., Detroit 11, Mich.* The MO Panelette is equipped with thermal-magnetic circuit-breaker units that "plug-in" on cylindrical bus bars. The plug-in feature simplifies changes or additions of circuits when load increases are necessary.



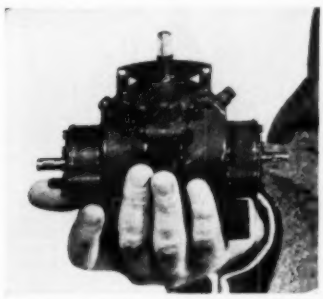
PHOTOSWITCH CONTROL—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* A photoelectric control, Type 20DJ1 for applications where the space is limited, has the phototube either integral with the housing or in a small separate housing as illustrated.



VARIABLE-SPEED TRANSMISSION—*Graham Transmissions Inc., 3754 North Holton St., Milwaukee 12, Wis.* Designed for vertical flange mounting, variable-speed transmission offers speeds from 1100 rpm to zero. It is available in sizes from ¼ to 1 hp.

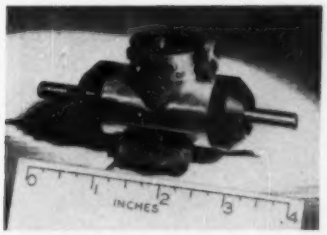


SPEED CONTROL — *The Reeves Pulley Co., Columbus, Ind.* The Reeves Vari-Speed Jr. is a self-adjusting V pulley. It is made for motors up to 1½ hp and any A or B V-belt. Speed ratios vary from 1⅜ to 2¾:1.

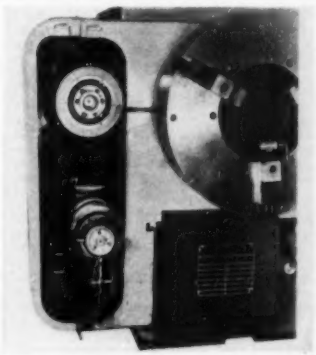


TRANSMISSION—*Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.* When driven at 2700 rpm, Model 10 Midget variable-speed transmission delivers speeds from 1800 rpm to zero. At 1800 rpm input, the unit gives speeds from 1200 rpm to zero.

VARIABLE-SPEED DRIVE—*Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.* Model 20 MT infinitely-variable speed transmission will handle small conveyors usually driven with motors up to ¼ or 1/3 hp.



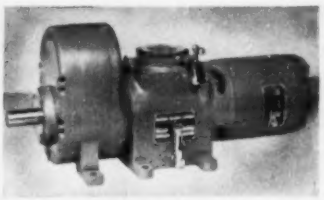
SPEED DRIVE—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colorado.* The Miniature variable-ratio speed changer weighs less than 6 oz and delivers up to 70 in.-oz torque and 0.025 hp. Operating speeds as high as 20,000 rpm are practical.



SPEED-CONTROL UNIT — *Allis-Chalmers, Milwaukee, Wis.* A combination of Vari-Pitch automatic sheave, companion sheave, wide-range Texrope belts, and Texslide motor base have been developed into a speed control for applications requiring frequent speed changes.

HELICAL-GEAR DRIVES — *Foote Bros. Gear and Machine Corp., 4545 South Western Blvd., Chicago 9, Ill.* Maxi-Power drives are available in 42 sizes with standard ratios ranging from 2.8:1 up to 360:1. Capacities range up to 1550 hp.

BELTS — *United States Rubber Co., Rockefeller Center, New York 20, N.Y.* To cut down on vibration, U. S. Rubber round endless belts are designed without splice. They are available in sizes ranging from 3/16 to ⅛ in. belt diameter and 6⅞ to 156⅜ in. inside circumferences.



TRANSMISSION—*Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.* Double-spur reduction variable-speed transmission gives high torque at low speeds. Micrometer control permits speed to be set within 1/400th of the dial periphery.

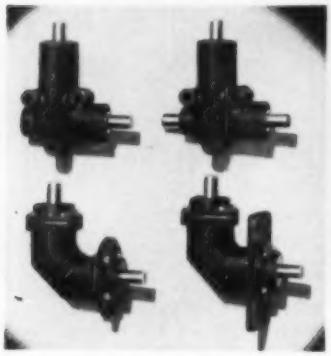
SPEED CONTROL UNIT—*Speed Selector Inc., 118 Noble Court, Cleveland 13, Ohio.* Variable-speed control unit using standard V-belts, with fixed centers at any distance, is available with either 1 or 2 hp, and has a 6 to 1 ratio.

SPEED REDUCER—*Euclid Universal Machine Inc., 15002 Woodworth Road, Cleveland, Ohio.* With speed-reduction ratio range from 10 to 1 to 3840 to 1, the Model V-2 vertical double-reduction speed reducer is adaptable for turntables and other vertical applications.

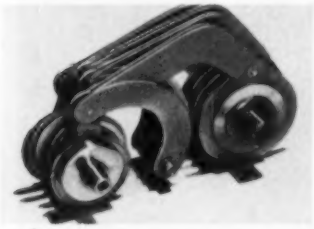
VARIABLE-SPEED TRANSMISSIONS—*Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.* Model 41MW includes built-in motor and built-in worm reducer. Models are available from 1/25 to 1 hp.

U-EXPANDER—*HPL Mfg. Co., 9013 E. 65th St., Cleveland 13, Ohio.* Produced in numerous heights of specially rolled brass strip material this metal spring expander is highly impervious to corrosion.

SPRING DEVICE—*Hunter Spring Co., Landsdale, Pa.* Here is a spring device which is said to work in reverse. It resists less the more it is deformed. The secret of the Neg'ator lies in prestressing each successive increment of length of a flat strip of spring stock.



BEVEL-GEAR DRIVES—*Airborne Accessories Corp., 25 Montgomery St., Hillside 5, N. J.* Angigear units are standardized right-angle bevel-gear drives suitable for use in either manual or power-operated systems. They are available in standard 1 to 1 ratio, in two sizes in four models.



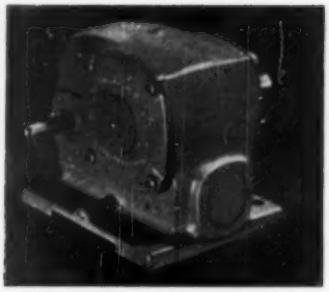
SPEED CONTROL—*Revco Inc., Dept. AM, 405 Thorpe Building, Minneapolis, Minn.* The operating principle of the "Zero-Max" is crank motion on the input shaft creating linear motion which is absorbed on the output shaft by a series of one way over-riding clutches. Speed can be varied from zero to a 4:1 ratio.

PRESSED-WOOD GEARS — *Techno Exports, Suite 2016, 25 Broadway, New York 4, N. Y.* "Lignostone" is pressed and impregnated beechwood, said to be harder than Lignum-vitae, tin, or aluminum. Noiseless, greaseless, spur and bevel gears made of this material are grease and gasoline resistant.

VIBRATORS—*The Cleveland Vibrator Co., 2752 Clinton Ave., Cleveland 13, Ohio.* Series SA pneumatically operated vibrators have low air consumption, minimum number of parts, and instant starting with full power.

METAL-POWDER PARTS—*The Wel-Met Co., 120 Gougler Ave., Kent, Ohio.* Metal powder is said to provide decreased scoring, closer tolerances, lower cost, and self-lubrication.

POWER TRANSMISSION — *Metal Seal & Products, Inc., 21807 St. Clair Ave., Euclid 17, Ohio.* The Augur Movement is a power transmission that converts and reduces constant-speed input to a quick-reversing action that interrupts the rotation of the output shaft every 45° of travel.



SPEED REDUCER—*Euclid Universal Machine, Inc., 15902 Woodworth Road, Cleveland 10, Ohio.* The CW-2 double-reduction horizontal-type speed reducer has a ½-output-hp capacity with 1000-in.-lb output torque, depending upon the ratio. Ratio range is from 10-1 to 3840-1.

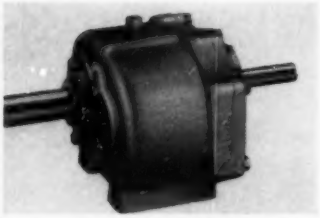
COUPLINGS—*Dodge Mfg. Co., Mishawaka, Ind.* Taper-Lock rigid couplings for connecting the ends of two shafts permit easy coupling or disengagement and provides the equivalent of a shrink fit by tightening two setscrews.

DOUBLE-REDUCTION UNITS—*Cone-Driver, Div. of Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich.* By using standard speed reducers as primaries and secondaries, double-reduction units give over 86,000 combinations as to capacity, model, and ratio.

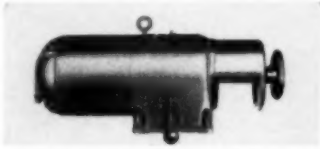
ENGINES — *Cushman Motor Works, Inc., Lincoln, Nebr.* Model R-40 single-cylinder four-cycle horizontal, hopper-type, water-cooled engine has a 56.6-cu in. displacement and develops up to 3¼ ft-lb torque and 6 hp over its operating range of 700-1000 rpm.

DIE SPRINGS—*Paragon Spring Co., 4615 W. Fulton St., Chicago 44, Ill.* The Paragon S-27 die-spring assortment contains 27 surface-stressed die springs, 11 in. long over-all with plain ends to fit holes from 7.16 to 19/16 in. and to fit rods from ¼ to 15/16 in.

MOUNTING—*Korfund Co., Inc., 48-15 32nd Place, Long Island City 1, N. Y.* Mounting on coil-spring Vibroisolators eliminates replacement of brick for 20-ton furnace. Reports indicate that life of arch and top have been increased nearly 2½ times.



AUTOMATIC TRANSMISSION — *Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich.* Two-speed automatic transmission can be used to supplement or replace two-speed motors, providing special ratios not obtainable with standard two-speed motors. Transmissions are built to handle up to 50-hp motors.

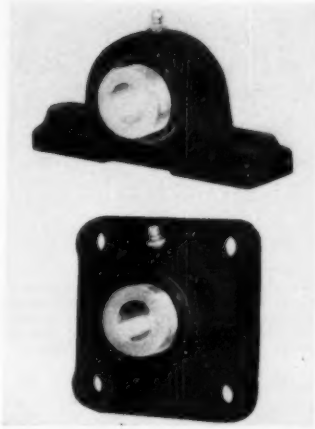


GEARSHIFT DRIVE — *The Lima Electric Motor Co., Dept. AA 91, Lima, Ohio.* Machine tools, formerly driven from a line shaft, can now be individually motorized by this selective-speed gearshift. Gearshift drive has three gear ratios as follows: low, 4 to 1; second, 2 to 1; third, 1.33 to 1; high, 1 to 1.

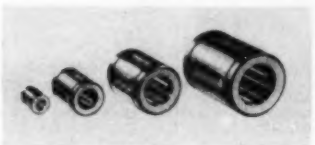
TOOL — *Double B Tool Co., 1561 E. 27th St., Cleveland 14, Ohio.* Weighing under 4 lb, this tool takes the place of an arbor and assorted step plates in removing and replacing fans, ball bearings, races, and seals from shafts, armatures, and similar units.

GEARHEADS — *Universal Gear Co., 1903 Arsenal Ave., Indianapolis 7, Ind.* No special parts or special machining is required to mount Universal gearheads on any standard NEMA Type C flange motor, whatever the make.

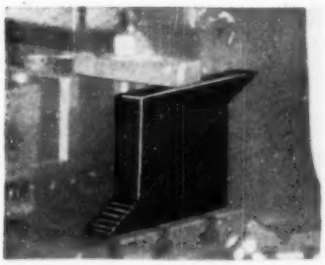
ANALYZER—*Richmont, Inc., 2810 E. 11th St., Los Angeles 23, Calif.* Livermont analyzer is a testing device for checking the tightening capacity, range, and adjustment of powered torque tools. Tool predetermines a standard and maintains it on the line.



BALL-BEARING UNITS — *Roberts Machine Works, Div. of Minnesota Bearing Co., 1619 Hennepin Ave., Minneapolis 3, Minn.* Ball-bearing units are available for medium loads and shaft speeds up to 1000 rpm. Both pillow blocks and flange units are available in sizes for shafts from ¼- to 1½-in. dia.



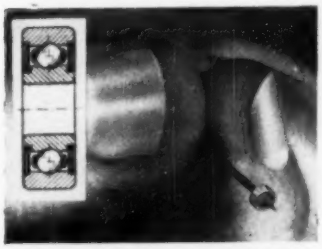
BALL BEARINGS — *Thomson Industries, Inc., Manhasset, N. Y.* The low-cost ball bearing is offered for linear motion. Series B Ball Bushings for ¼-, ½-, ¾-, and 1-in. shaft diameters are now in production.



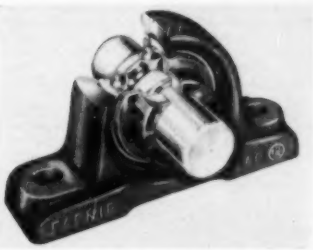
SUPPORT BLOCKS—*Podlin Tool Co., 3920 Wesley Terrace, Schiller Park, Ill.* Clamp support blocks are offered for toolrooms and machine shops in 1/16-in. increments of adjustment for height in both vertical and horizontal positions.

BEARINGS—*Wagner Electric Corp., 6489 Plymouth Ave., St. Louis 14, Mo.* Worn sleeve bearings can be replaced in one operation with this tool consisting of a steel rod, finished to accommodate precision-bored bearings on one end, and unbored bearings for undersize shafts on the other.

BEARING — *The Schatz Mfg. Co., Poughkeepsie, N. Y.* Both angular-contact and thrust bearings are included in the wide range of sizes in the Schatz line. Superfine race finish prevents overheating of the bearing.



ANNULAR BALL BEARING—*Landis & Gyr, Inc., 104 Fifth Ave., New York 11, N. Y.* Latest addition to the R.M.B. line, known as Type R-073, is claimed to be the smallest, commercially produced annular ball bearing.

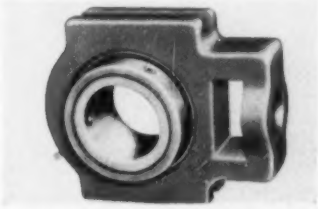


PILLOW BLOCKS—*The Fafnir Bearing Co., New Britain, Conn.* Pillow blocks equipped with Fafnir Mechani-Seal ball bearings are produced in nine shaft sizes ranging from 13/16 to 2 15/16 in.

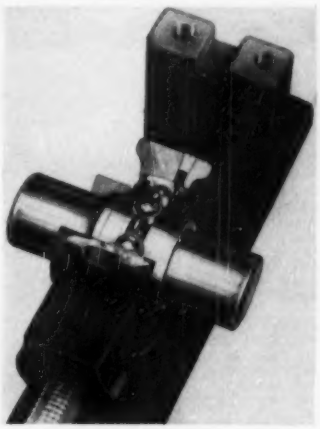
BUSHING—*Thomson Industries, Inc., Manhasset, N.Y.* Designed to give anti-friction support to linear motions along 1½-in.-dia guide rods or reciprocating shafts, the Thomson Ball bushing has an OD of 2.375 in. and an over-all length of 3 in.

BUSHINGS ADAPTER—*Dodge Mfg. Corp., Mishawaka, Ind.* An adapter for taper-lock bushings is used where it is more convenient to use a straight bore in the hub than to drill and taper bore hubs to accommodate bushings.

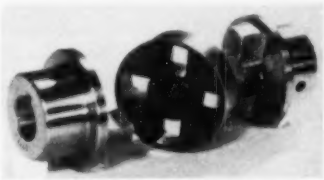
BALL BEARING — *Miniature Precision Bearings, Inc., Keene, N. H.* Miniature ball bearing is of the full-race radial type with 15 1mm balls. All surfaces are precision finished.



BALL-BEARING UNIT—*Dodge Mfg. Corp., Mishawaka, Ind.* Wide-slot SC ball-bearing takeup unit consists of a deep-groove precision bearing with large balls and retainer inclosed in an outer housing with milled slots on each end for supporting guides.



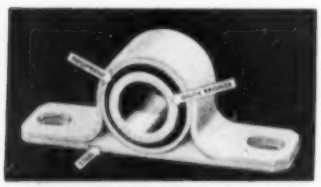
BEARING TAKE-UP UNITS—*The Fafnir Bearing Co., New Britain, Conn.* Especially adaptable for conveyor construction, shaft adjustment, and belt tightening devices, LTU take-up units range in shaft sizes from ¾ to 2 7/16 in.



FLEXIBLE COUPLING — *Estey Co., 547 N. Main St., Canandaigua, N. Y.* Flexible coupling has a steel-banded synthetic-rubber spider which will carry heavy loads under severe operating conditions without thrust on the driver or driven, and without distortion, backlash, or chatter. A steel retaining ring prevents distortion and dissipates heat.

PILLOW-BLOCK — *SKF Industries, Inc., Front St. and Erie Ave., Philadelphia 32, Pa.* Available with either ball or spherical roller bearings, anti-friction bearing pillow block is for shafts revolving at high speeds. It is available in shaft sizes from 1 7/16 to 2 7/16 in.

END-THRUST BEARING — *Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh 5, Pa.* Containing a double-direction, anti-friction thrust bearing mounted on a pin which fastens to the roll, this end-thrust bearing is designed to work with conventional plain radial bearings on rod or bar mills.



SLEEVE BEARING—*Bushings, Inc., Coolidge Highway at 14 Mile Road, Royal Oak, Mich.* Pre-lubricated sleeve bearing features a means of compensating for both parallel and angular misalignment, reduces transmission of noise, and provides for shock absorption.

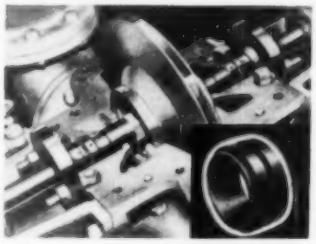
PILLOW BLOCK, FLANGED CARTRIDGE—*Boston Gear Works, Quincy 71, Mass.* A pillow block and a flanged cartridge offer self-aligning precision ball bearings. Spherically ground OD cuts mounting time as bearing aligns on shaft.

BUSHINGS—*The duMont Corp., Greenfield, Mass.* Collared bushings are offered for use with Minute Man keyway broaches in sizes from ⅛ to 1 9/16 in. Larger sizes are available on special order.

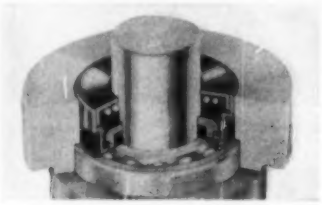
AIR HOSE—*The B. F. Goodrich Co., Akron, Ohio.* Type 22 air hose, made with oil-proof rubber compounds, is available in ¼-, 5/16-, and ⅜-in. sizes. Weights per 100 ft are 10.3, 12.2, and 15.1 lb respectively.

FEED STOP—*Dahlstrom Mfg. Co., 2580 W. Larpenteur Ave., St. Paul, Minn.* The Autostop is an adjustable automatic stock-feed stop which will work with blanking, progressive, or compound dies.

UNIVERSAL JOINTS—*Lovejoy Flexible Coupling Co., 5001 W. Lake St., Chicago 44, Ill.* The Dix precision-built universal joints are guaranteed to be concentric within 0.0005. All rivets are ground flush within the body of the joint to permit working inside tubing or in close quarters.



SEAL—*Morganite, Inc., 5302 48th Ave., Long Island City, N.Y.* Immune to most chemical attacks, Morganite self-lubricating mechanical carbon seals are for sealing highly volatile fluids under high pressures that are in continuous service at high speeds.



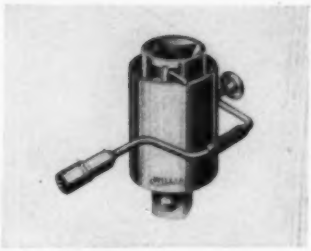
SHAFT SEAL—*Seal Div., Gits Bros. Mfg. Co., 1846 S. Kilbourn Ave., Chicago 23, Ill.* Packaged seal unit is for horizontal- and vertical-rotating shafts. Both rotating and stationary surfaces are built inside a metal cartridge.

ROTARY ACTUATOR—*Airborne Accessories Corp., Hillside 5, N. J.* Rotorac electrically powered right-angle rotary actuator incorporates built-in radio noise filter, optional position-indicating transmitter, and adjustable center-position switch for indicating or seeking.

RIVETLESS CHAIN—*The Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich.* Keystone rivetless chain, X-458, is assembled or disassembled without use of any tools. It has no rivets, welds, or bolts, requires no special or joining links, and may be discontinued at any point.

COUPLINGS—*Morse Chain Co., 7601 Central Ave., Detroit 8, Mich.* Single-connecting pin design for Morse series DRC stock double-roller chain couplings is said to increase ease with which couplings can be assembled and disassembled.

CENTRIFUGAL SWITCH — *Euclid Electric & Mfg. Co., Madison, Ohio.* Centrifugal switch is for plugging, overspeed or underspeed protection, non-plugging, and motion interlocking. A ball bearing is mounted on the contact-making arm to minimize friction.



RATCHET ADAPTER — *J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* Ratchet action is possible in limited quarters with the Williams ratchet adapter. Ratchet gear has 30 teeth. Shift lever reverses action.

COUPLING — *Morse Chain Co., 7601 Central Ave., Detroit 8, Mich.* Titled the Mighty Midget, an all-rubber center coupling has been designed to improve power transmission in fractional horsepower motors.

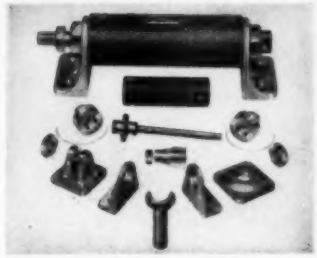
COUPLING—*Boston Gear Works, Quincy 71, Mass.* A flexible coupling with a synthetic rubber insert has simple, three-piece construction. It is available for shafts ⅜ to 1½ in. dia.

CLUTCH — *The Edgemont Machine Co., Dayton, Ohio.* Installed between motor and driven machine, the Edgemont clutch mechanism is a standard Edgemont gear-tool drive, known as Type FS, for starting and stopping the flow of mechanical power.

CLUTCH PARTS—*The Wel-Met Co., Kent, Ohio.* The cup and flange of this clutch are made of an iron-base powder mix, while the brake shoes are made of a leaded iron copper material.

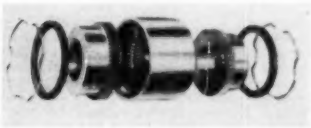
SWIVEL JOINT—*Seamless Co. Inc., 41-24—24th St., Long Island City, N. Y.* This swivel joint called "Swivlex" is suitable for 400-psi max pressure and 600-F max temperature.

CLUTCH—*W.S.K. Inc. 405 Donovan Bldg., Detroit 1, Mich.* The variable-pitch diameter Flex-A-Matic clutch is an automatic clutch for V-belt drive. It is suited for gasoline or electric power sources.



CYLINDER — *Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Low-cost Feed Ring series cylinders offer a variety of interchangeable mounting brackets.

HYDRAULIC CYLINDERS—*Ortman-Miller Machine Co., Inc., Hammond, Ind.* Cylinders, operated with air, water, or hydraulic power are of simple tie-rodless construction. They are available in bore sizes from 1½ to 8 in.



COUPLING—*Sier-Bath Gear & Pump Co. Inc., North Bergen, N. J.* Made of forged high-carbon steel and with internal teeth running the full working length, this gear coupling has only seven parts.

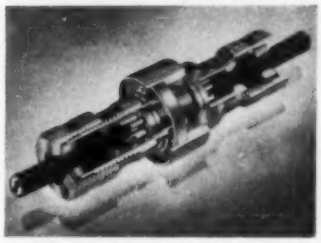
CUSHION CYLINDERS — *Gerotor May Corp., Baltimore 3, Md.* Series 100 cylinders of 150-psi air, and 300-psi oil capacity are standard cylinders employing cushion units. Design provides effective cushioning of the piston stroke by compression of the displayed air or fluid.

COUPLING—*Kelite Products, Inc., Box 2917, Terminal Annex, Los Angeles 54, Calif.* Universal swivel-ball-joint coupling for pipe or hose is leakproof and vibration proof. It will turn 20° in any direction with no restriction of flow regardless of angle.

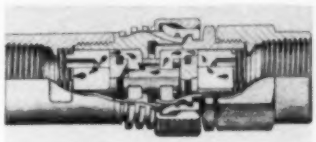
CABINET VALVE—*Lehigh Foundries Inc., Easton, Pa.* Lehigh-Marton combination cabinet four-way valve, Model 3MA13, has pressure regulator, lubricator, air gage, and strainer. Over-all height is 9 5/16 in., width 7 5/16 in., and depth 4⅛ in.

VALVE—*The Ross Operating Valve Co., Detroit 3, Mich.* The Ross Water-Saver valve controls coolants. The control allows the coolant to run when needed but automatically turns it off between required periods.

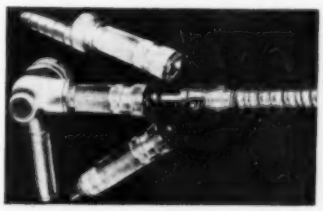
PRESSURE VALVES—*Emmett Machine & Mfg. Inc., 2249-1 Fourteenth St., S.W. Akron 14, Ohio.* Diaphragm-actuated two-pressure Merit valves for application in high-pressure hydraulic service range in size from 1 to 4 in. and can be furnished for operation on systems having 3000-, 5000-, and 10,000-psi pressure.



COUPLING—*Roylyn Inc., 718 West Wilson Ave., Glendale 3, Calif.* Quick-disconnect electrical coupling for all-weather and submarine application is known as the 1600 series.



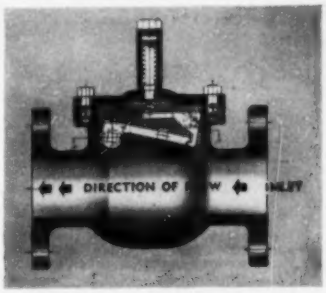
COUPLING—*E. B. Wiggins Oil Tool Co., Inc., 3424 East Olympic Blvd., Los Angeles 23, Calif.* Reported to have very high flow characteristics, the P-1900 Series ¾-in. double self-sealing coupling shuts off both ends of the line when uncoupled with minimum loss of fluid.



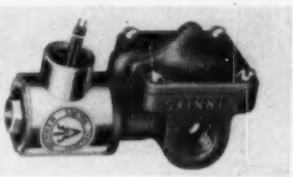
COUPLING—*Wyzenbeek & Staff, Inc., 823 W. Hubbard St., Chicago, Ill.* Wyco quick-change handpiece coupling offers quick snap-on-or-off changes made from a straight handpiece to an angle head or from a grinder to a sander.

TUBE UNIONS—*Roylyn Inc., 718 W. Wilson Ave., Glendale 3, Calif.* Lightweight, quick-connecting tube union is for joining flared tubing. The 1900 Series is designed to meet the need for a lighter-weight connection in fluid lines.

DISK FOOT VALVE — *Galland-Henning Mfg. Co., Milwaukee 7, Wis.* Two redesigned foot valves, the Model F and Model R Nopak foot valves, have several installation and operating advantages. Principal change is the elimination of internal exhaust core in valve disk.



VALVES—*Security Valve Co., 410 San Fernando Road, Los Angeles, Calif.* Low-pressure shutoff valves incorporate a precision-lapped synthetic-rubber seat.



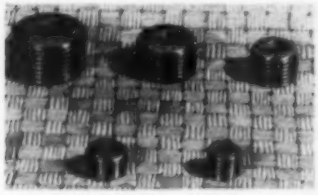
SOLENOID VALVE — *Skinner Electric Valve Div. of Skinner Chuck Co., Norwalk, Conn.* Series M-3, three-way bronze-body solenoid valves are designed for use with petroleum oils, kerosene, gasoline, water, air, and inert gases with operating pressures from 20 to 150 psi.

HYDRAULIC HOSE — *J. N. Fauver Co., Inc., 49 West Hancock, Detroit 1, Mich.* Highly flexible RR 2-ply rayon-cord hydraulic-hose assemblies can be fitted with any combination of pressed-on male or female solid or union couplings, available in sizes ¼- to 1-in. ID.

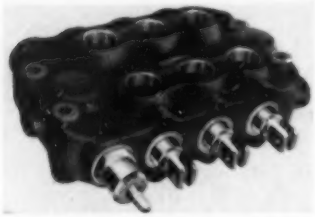
PILOT VALVES—*Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill.* Pilot valves are for direct control of small cylinders or automatic control of large cylinders. The cam lever and pushbutton types are three-way valves and the foot-operated units are four-way.

NEEDLE VALVE—*C. A. Norgren Co., 228 Santa Fe Drive, Denver 9, Colo.* Built with tapered-point needles for closer flow control and leakproof seating, this Norgren high-pressure needle valve is designed for control of air, fluids, and gases under pressures up to 3000 psi.

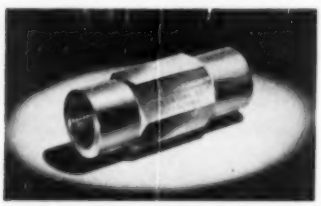
VALVE—*Airmatic Valve Inc., 1643 E. 40th St., Cleveland, Ohio.* Quick-exhaust valve, Model QE 500, is available for air, oil, and water at pressures to 200 psi, in ¼-, ⅜-, ½-, ¾-, and 1-in. pipe sizes. It is non-corrosive and has only two moving parts.



PIPE PLUGS—*J. J. Tourek Mfg. Co., 4701 W. 16th St., Chicago 50, Ill.* Tourek standard countersunk pipe plugs can be furnished to special order in alloy steels, aluminum, or brass in sizes up to 2½ in. dia.



OIL CONTROL VALVE — *Hydraulic Equipment Co., 1100 E. 222nd St., Cleveland 17, Ohio.* V8 series oil-hydraulic control valves are for large-volume hydraulic systems including heavy-duty industrial equipment and hydraulic presses.

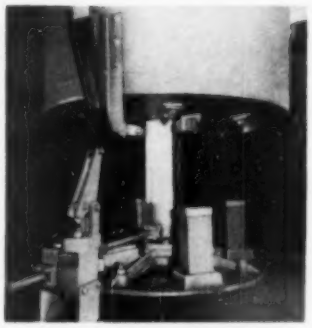


SHUTOFF VALVE—*Olin Engine Co., 9-11 Lafayette Ave., Buffalo 13, N. Y.* Automatic safety shutoff valve, for compressed air lines, fits standard connections. When break occurs in hose, valve closes permitting only a light stream of air to escape through a by-pass.

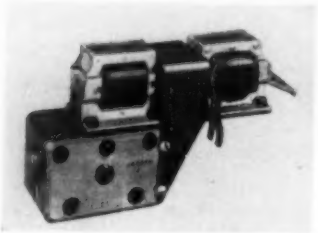
FEED CONTROLLER — *National Pneumatic Co., Graybar Bldg., New York, N. Y.* Power-Check precision feed controller can be employed to automatically retard speed and ease pressure at desired points of feed-travel.

DRAIN — *Quincy Compressor Co., Quincy, Ill.* Said to completely eliminate manual draining on all types of air compressors having bleed or pressure unloaders, the Quincy Dri-R-Air tank drain can be installed with a few feet of ¼-in. OD copper tubing plus a standard L.

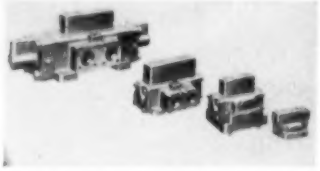
VALVES — *C. B. Hunt & Son, Inc., Salem, Ohio.* Small single-plunger valves known as Series O and OE are balanced and will remain in position until changed. They are furnished capped for either ⅛- or ¼-in. pipe connection.



THROTTLE VALVE — *R. D. Wood Co., Public Ledger Bldg., Philadelphia, Pa.* High-pressure, hydraulic-throttle Protectomatic valve controls the falling speed of a weighted accumulator, preventing it from crashing on its bumper blocks. It operates from 1500 to 5000 psi.



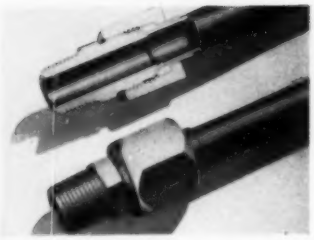
CONTROL VALVE—*John S. Barnes Corp., Rockford, Ill.* Type 89 valve is a compact double-solenoid directional-control valve. It is the smallest of the line of Barnes four-way valves.



CONTROL VALVES — *Vickers Inc., Div. of the Sperry Corp., 1419 Oakman Blvd., Detroit 32, Mich.* Series DG solenoid controlled 2-, 3-, and 4-way directional-control valves feature small solenoids, low inrush and holding current, and open, closed, and partially blocked valving modifications.

DRAIN VALVE — *Wilkerson Valve Inc., 260 South Dale St., Denver, Colo.* The Wilkerson valve automatically drains off all water and oil that may collect in air lines together with dirt, rust flakes, dust particles, or other abrasive matter.

VALVE—*Worthington Pump & Machinery Corp., Harrison, N. J.* Originally designed for observing the clarity of hot water passing through water-treating systems, the valve-type sight glass can be used in any system through which transparent liquids flow.



TUBE FITTINGS—*The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.* Designed to meet the Joint Industry Conference Hydraulic Standards for Industrial Equipment, the Triple-lok fitting is a three-piece flared unit with a sleeve which acts as a lock washer, damps vibration, and prevents wiping of the flare during make-up.

TUBE FITTING — *Crawford Fitting Co., Cleveland 17, Ohio.* "Swagelok" clinch-type fittings provide leakproof seals at three points. Two ferrules and a threaded chuck clamp around a tube have virtually no effect on the inner wall.

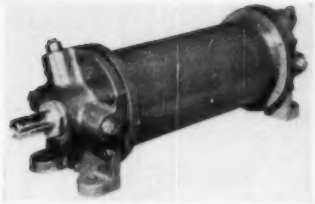
VALVE INSTALLATION—*Ross Operating Valve Co., 120 East Golden Gate, Detroit 3, Mich.* Increased production is claimed with valve installation centered around the new Full-Flo master valve. This method places three-way valves, one normally open and one normally closed, at each end of the cylinder.

POWER UNITS — *The Rucker Co., 4228 Hollis St., Oakland, Calif.* Standard Rucker units, over 40 models in all, for industrial fluid power requirement, range from 2 to 75 hp with special models built for any power requirement up to 300 hp.

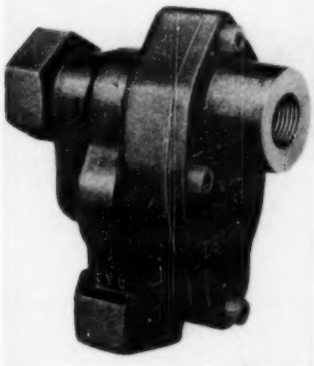
ROTARY VALVE—*Morganite Inc., 3804—48th Ave., Long Island City 1, N. Y.* A rotary valve for liquid meters handles all types of fluids. The self-lubricating valve is resistant to corrosion and severe chemical attack.

CONTROL VALVE—*Hydraulic Equipment Co., 1100 E. 222nd St., Cleveland 17, Ohio.* The V13 series control valves will handle several oil-hydraulic cylinders simultaneously. It can be furnished with control plungers for actuating two, three or four single-acting or double-acting cylinders at operating pressures up to 1400 psi.

REDUCING VALVE—*The Leslie Co., 129 Delafield Ave., Lyndhurst, N. J.* Class HS high-pressure reducing valve is of internal-pilot piston-operated construction, and is for steam, air or gas service. It handles inlet steam pressures from 300 to 1500 psi and air or gas inlet pressures from 300 to 3000 psi.



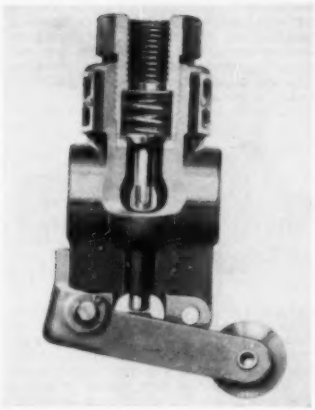
AIR CYLINDERS—*Tomkins-Johnson Co., Jackson, Mich.* Round snap rings, seated in grooves in the cylinder body, and steel clamping collars have replaced tierods in this line of T-J air cylinders.



VALVE—*Ross Operating Valve Co., 120 E. Golden Gate, Detroit 3, Mich.* Quick-exhaust air valve enables cylinders to start their return stroke in a split second. Valve acts as a supplementary exhaust to the regular operating valve.

AIR CONTROL VALVE—*Logansport Machine Co., Inc., Logansport, Ind.* Three-position, double, four-way air valve is for operating two double-acting air cylinders. All six ports are tapped for ¼-in. pipe.

VALVES—*Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.* Valvair double-solenoid valves for air pressures of 0 to 125 psi are offered in ⅛-, ¼-, ⅜-, ½-, and ¾-in. sizes.



VALVE—*Palmer-Shile Co., 16020 Fullerton Ave., Detroit 27, Mich.* Air-valve permits removal of metal chips and other scrap material. The Air Saver valve can be mounted in any position to operate at any angle, unaffected by machine vibration.

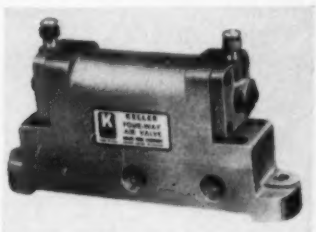
CONTROL VALVES—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Additions to the CV control-valve series include a cam-operated model and a foot-controlled valve with spring-return action. Seals may be replaced without removing valve from piping.

REDUCING VALVE—*Atlas Valve Co., 282 South St., Newark 2, N. J.* High-pressure reducing valve handles working pressures to 6000 psi. It is recommended for reducing the pressure of water, oil, and compressed air.

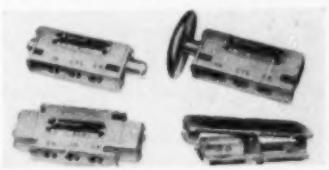
VALVE — *C. E. Hunt & Son, Inc., Salem, Ohio.* With a pilot cylinder which operates at pressures as low as 25 psi, these double-piloted single-plunger valves are considered well suited for use in safety-control arrangements on presses, shears, cutters, and for air clutches and sequence operating cycles.

SOLENOID-CONTROLLED VALVE—*Crescent Valve Co., 6075 State St., Huntington Park, Calif.* Model 1044 is a fast-acting, tight-seating valve for handling air, water, and light oils. It has been run as high as 1800 cycles per minute.

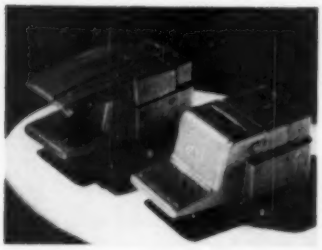
AIR-POWERED VALVE—*The Bellows Co., Akron, Ohio.* Solenoid-actuated air-controlled valve operates at speeds over 2200 movements per min. The valve will operate on 5- to 150-lb airline pressure. It is available in ¼- and ⅜-in. port sizes.



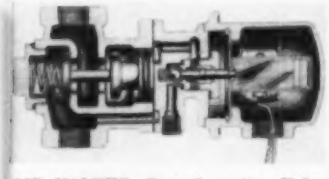
AIR VALVES—*Keller Tool Co., Grand Haven, Mich.* Line of four-way air valves is of the balanced-piston type. Valves control double-acting air cylinders for use with air tools or fixtures requiring fast, accurate control.



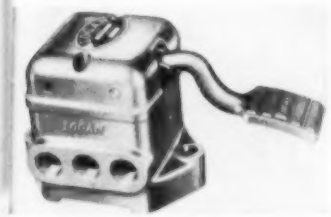
CONTROL VALVE—*Modernair Corp., 4222 Hollis St., Oakland, Calif.* CRV series pilot valve, when used in conjunction with CV series valves, constitutes an air limit switch. Valves are for pneumatic or fluid circuits.



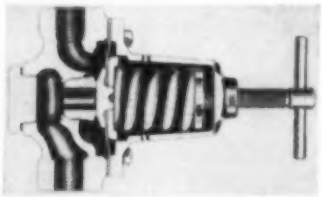
CONTROL VALVE—*Hannifin Corp., 1118 S. Kilbourn Ave., Chicago 24, Ill.* Piston operated and pilot controlled, the reciprocating packless disk-type Model NFS valve directs compressed air alternately to two pressure ports for the operation of a double-acting air cylinder.



AIR VALVES—*Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3, Mich.* Control of air power on machine tools and similar applications is provided by a series of Full-Flo in-line valves. Standard valves handle vacuum as well as air, liquid, or gas pressures to 125 psi.

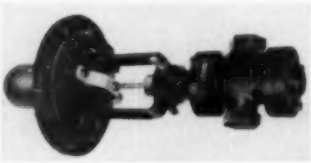


CONTROL VALVE—*Logansport Machine Co., Inc., Logansport, Ind.* Model 6552 foot-operated, four-way control valve is built in three sizes: ⅜-, ¾-, and 1-in. ports, and is designed for pressures to 150 psi.

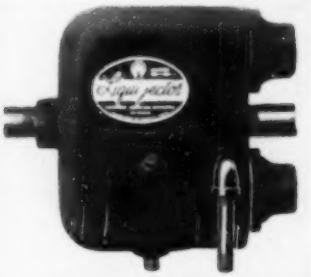


RELIEF VALVE—*C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo.* The "Series 62-A" diaphragm relief valve is suited to lines carrying air, cold water, oil insecticides, and similar liquids at pressures up to 250 psi. Operation is fully automatic.

SOCKET PRESSURE PLUG—*Standard Pressed Steel Co., P. O. Box 4, Jenkintown, Pa.* Socket pressure plug seals pressure tight without the use of sealing compounds. Design provides actual crushing or sealing at both major or minor diameters.



VALVE—*The Foxboro Co., Foxboro, Mass.* Without removing it from its installation or shutting down controlled flow, the Foxboro Stabiliflo valve can be changed from air-to-open to air-to-close, or vice versa, within a few minutes.

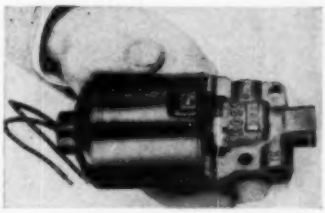


AIR, GAS LINE CLEANER — *Selas Corp. of America, Philadelphia, Pa.* Water and water-oil emulsions are removed automatically and continuously from compressed-air or gas lines by the Liqui-jector.

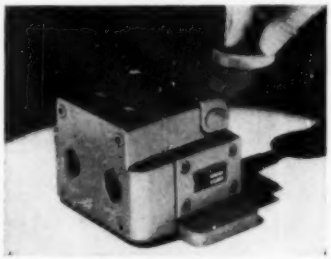
CUTOUT — *Greer Hydraulics, Inc., 454 18th St., Brooklyn, N. Y.* Model DV15-200 was designed to meet the demand for positive automatic protection of all gages in a multi-gage pressure system.

DUAL VALVE—*R-S Products Corp., Wayne Junction, Philadelphia 44, Pa.* This 36x8-in., 150-lb Class B steel dual valve operates at a temperature of 1000 F. Powered by separate electric motors, each alloy-steel vane is operated independently.

HEX-SOCKET PLUGS — *The Allen Mfg. Co., Hartford 1, Conn.* Two new hex-socket pipe plugs have been developed to eliminate important causes of sealing failures. Plugs are pressure formed and threaded.

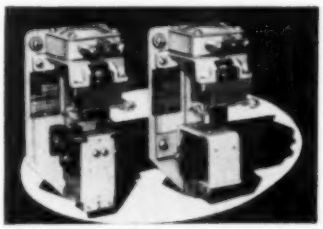


AIR-CONTROL VALVE—*Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3, Mich.* Quick-operating air-control valve is ¼-in. pipe size, straightway or three-way with in-line, side, bottom, or panel mountings.

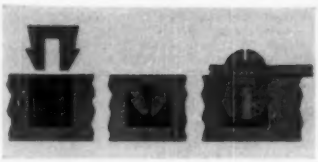


VALVE — *Hannifin Corp., 1118 South Kilbourn Ave., Chicago 24, Ill.* Model NHS actuates single- or double-acting pneumatic cylinders and other air-operated equipment. Four-way directional air control is provided.

SWIVEL CONNECTORS—*The Cleveland Vibrator Co., 2752 Clinton Ave., Cleveland 13, Ohio.* Air-tight swivel connectors are for use with all types of compressed-air-operated tools. Connectors provide a full 360° swivel action.

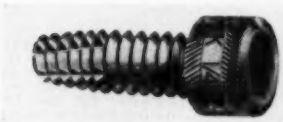


PNEUMATIC TIMER—*Square D Company, 4041 N. Richards St., Milwaukee 12, Wis.* Timing period for dc pneumatic timer, Class 9050, is adjustable from 0.2 sec to 3 min.



SCREW-LOCKING INSERTS—*Brush Nail Expansion Bolt Co., Greenwich, Conn.* These screw-locking inserts require no special tools, and provide ready-tapped holes for plastics and materials too thin to tap.

NUT—*Townsend Co., New Brighton, Pa.* The hexagonal locking insert in the cold-forged Townsend Tuflok nut resists both moisture absorbing and drying.



CAPSCREW — *Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.* The P-K self-tapping socket-head capscrew cuts a thread in a plain drilled hole in metals or plastics as the screw is turned in, eliminating tapping operations.

CLAMPING FIXTURES—*Morton Machine Works, 2421 Wolcott St., Detroit 20, Mich.* Morton fixture clamps, developed for clamping a casting through the bored hole of a pilot plate, employ an aligned T-bolt, engaging a hardened insert.

SEALING WASHERS—*Franklin C. Wolfe Co., 407 Commercial Center St., Beverly Hills, Calif.* The Lock-O-Seal washers provide a locking as well as a sealing action, for screws, bolts, rivets, tubing, and wiring. They consist of small doughnut-shaped rings of sealing material inside washer-like retainers.

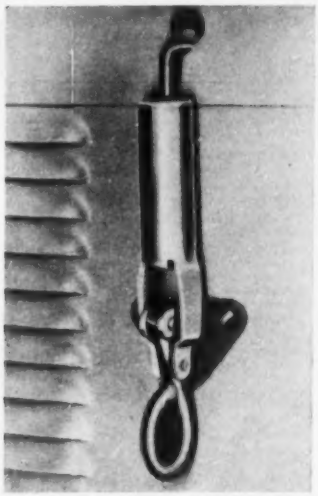
LOCKNUT—*Security Lock Nut Corp., 1815 North Long Ave., Chicago 39, Ill.* Consisting of a standard steel nut in a slightly elliptical retainer ring, this Security locknut holds in any position on the threaded part.

SCREWS—*American Screw Co., Providence 1, R. I.* Used in pneumatic, electric, spiral, or hand-ratchet drivers, one-piece stick of identical screws makes fastening faster and simpler. Screws are twisted off automatically and fastening made when a predetermined torque is reached.

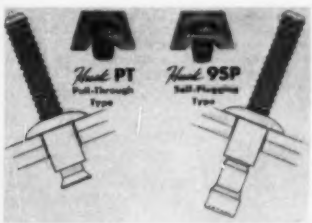
MICRO-NUT—*Gairing Tool Co., P. O. Box 478, Roosevelt Park Annex, Detroit 32, Mich.* Full-Grip Micro-Nut is recommended for individual tool adjustment on multiple-spindle setups and may be used on threaded adapters and holder assemblies with or without keyways.

BOLTS, NUTS—*California Precision Castings, Inc., Glendale, Calif.* Bolts, nuts, and other types of fasteners offering good properties for severe services at elevated temperature in highly stressed applications are available in several of the ultra-high temperature service alloys.

KEY-LOCKING DEVICE — *Coffing Hoist Co., Danville, Ill.* The "E-Z Off" key-locking device is a coupling for attaching all kinds of connections to power shafts. Self-locking nuts eliminate pinning the nut to a bolt shaft or axle.



HOOD FASTENER—*Donaldson Co., 666 Pelham Blvd., St. Paul, Minn.* A heavy-duty spring-loaded fastener holds sheet-metal flaps, panels, and hoods closed.



BLIND RIVETS—*Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.* Huck Pt pull-through and 9SP self-plugging blind rivets are available in 1/8-, 5/32-, 3/16-, and 1/4-in. dia.

SCREW—*Alden Products Co., 117 N. Main St., Brockton 64, Mass.* The Alden Cap-Captive screw can be turned with an ordinary coin when no tools are available, but will also accept a standard Allen wrench or screwdriver.

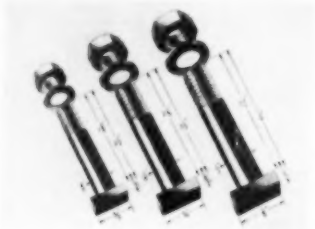
CHUCK SLEEVES, NUTS — *Balas Collet Manufacturing Co., 1557 E. 27th St., Cleveland 14, Ohio.* Chuck sleeves and chuck nuts for replacement in Brown & Sharpe machines are available in a complete range of sizes from 00 to 22.

TOGGLE CLAMP—*Detroit Stamping Co., Finished Products Div., 343 Midland Ave., Detroit 3, Mich.* Clamping bar of this compact toggle clamp moves into a retracted, vertical position away from work as clamp is opened. Clamp comes equipped with rubber-tipped bolt assembly adjusted both horizontally and to work height.

FLANGED NUTS—*Northwestern Tool and Engineering Co., Dayton 3, Ohio.* A range of sizes from 5/16-in. to 1-in. flange nuts eliminates the use of loose washers.

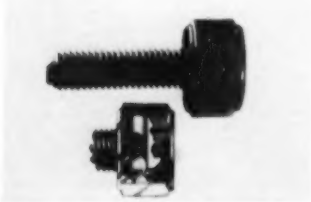
PARTS and MATERIALS—Fastening Devices

SELF-LOCKING RETAINER—*Waldes Kohinoor, Inc., Long Island City 1, N. Y.* A self-locking Truarc Triangular retainer, Type 5305 is useful in developing tight assemblies, free from end play on relatively soft shafts such as cold-rolled steel, castings, and plastic materials.



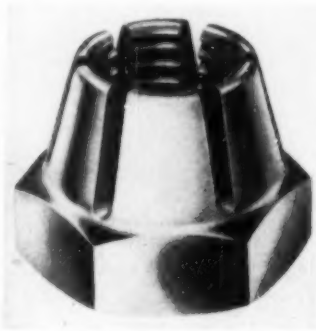
BOLTS—*Boyar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* Toolpost bolts for automatic screw machines are made in three sizes: 5/16 for No. 00, 7/16 for No. 0 and ½ for No. 2 size screw machines.

SOCKET SCREW KEY SETS — *The Holo-Krome Screw Corp., Hartford 10, Conn.* Made of special-analysis nickel alloy steel, Holo-Krome key sets come in lightweight strong plastic packs. Different sets are especially suited for different types of work.

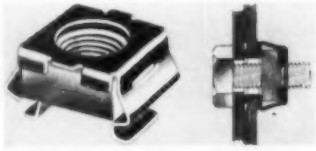


THUMBSCREW—*Vlier Mfg. Co., 4552 Beverly Blvd., Los Angeles 4, Calif.* Adjustable-torque thumb screw will hold at proper tension during machining and can be set by tool engineers to end pressures of 5 to 50 lb.

BOLTS—*West Point Mfg. Co., 19625 Merriman Court, Farmington, Mich.* Mounting-bolster and T-slot bolts made in accordance with standards recently adopted by the Joint Industrial Conference of American Manufacturers are being manufactured by West Point Mfg. Co.



NUT — *Elastic Stop Nut Corp. of America, 2330 Vauxhall Rd., Union, N. J.* For applications where temperature ranges from —65 to 1200 F, these fasteners are all self-locking and provide permanent protection against vibration, impact, and stress reversal in both fully seated and position settings.



NUT RETAINER—*Tinnerman Products, Inc., 2038 Fulton Road, Cleveland 13, Ohio.* Speed Grip nut retainers are snapped into place by hand, or with a screwdriver, and their spring-steel mechanical hands hold the nut in bolt-receiving position.

STAINLESS STEEL—*The Carpenter Steel Co., Reading, Pa.* Carpenter Super-Corrosion-Resistant Stainless No. 20 is now being commercially produced in the forms of sheet and plate.

STEEL — *The Carpenter Steel Co., Reading, Pa.* Samson Extra, alloy steel for plastic-mold cavities and force plugs, is said to provide excellent hobbing qualities and good machinability with high core strength. Maximum Brinell hardness is about 105.

ALLOY STEEL—*Joseph T. Ryerson & Son, Inc., Chicago, Ill.* Rycut is recommended by its producers for the manufacture of strong, tough parts involving considerable machining.

PUNCHING STOCK — *Rogers Corp., Manchester, Conn.* Rogers Corp. is supplying laminated phenolic punching stock in standard thicknesses as sheet or punched parts to meet NEMA specifications XP and XXP.

STEEL BAR STOCK—*Carnegie-Illinois Steel Corp., 434 Fifth Ave., Pittsburgh 30, Pa.* Fast cutting is possible with the MX free-machining steel. When used in automatic screw-machine operations, this steel is said to provide longer tool life and improve surface finish of parts.

HIGH-CHROME ALLOY — *American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.* Thermalloy HC-250 is a high-chrome alloy said to have exceptional resistance to abrasion, oxidation, and wear at elevated temperatures.

SCREW STOCK — *LaSalle Steel Co., Chicago, Ill.* La-led is a lead-bearing cold-finished steel-bar free-machining screw stock which is reported to provide from 44 to 106% better machinability than regular B-1113 stock.

STAINLESS STEEL — *Armco Steel Corp., Middletown, Ohio.* Armco 17-4 PH stainless-steel alloy has high hardness and strength, excellent corrosion resistance, good fabrication characteristics, and requires only 850 to 1000 F hardening treatment.

STEEL—*Jones & Laughlin Steel Corp., Pittsburgh 30, Pa.* J&L "E" steel can be machined 10 to 25% faster than the fastest standard free-machining Bessemer screw steel, and is now furnished in cold-finished bars.

HIGH-SPEED STEEL—*Universal Cyclops Steel Corp., Dept. ANI, Bridgeville, Pa.* Unicut is an intermediate molybdenum-tungsten high-speed steel with high carbon and high vanadium.

ALLOY STEEL—*Joseph T. Ryerson & Son, Box 8000-A, Chicago 80, Ill.* Rycut free-machining alloy steel is said to develop hardness comparable with that of AISI 4150-SAE 4150.

NICKEL CHROMOLOY—*The Duriron Co. Inc., Dayton 1, Ohio.* Durimet 20 was developed during the war for severe corrosive applications that standard 18-8 stainless steels did not withstand. Its most notable application is for handling sulfuric acid.

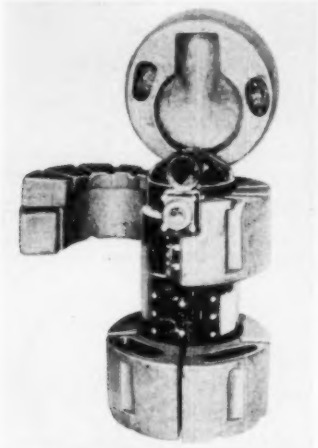
LEAD ALLOY — *National Lead Co., 111 Broadway, New York 6, N. Y.* Nalco Metal is specifically designed to give chromium platers longer-lived tank linings, heating and cooling coils, and anodes.

CAST IRON—*The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.* Ductile cast iron combines the process advantages of gray cast iron such as fluidity, castability, and machinability, with the product advantages of cast steel.

ALLOY—*Driver-Harris Co., Harrison, N. J.* Karma alloy offers unusually high electrical resistivity, and the ability to retain stable resistance values over wide ranges of temperature. Tensile strength is 130,000 to 180,000 psi at room temperature.

ALLOY—*Cerro de Pasco Copper Corp., New York City, N. Y.* Cerrocast, a non-eutectic alloy of bismuth and tin, has a melting range of 281-339 F, yield temperature 302 F, Brinnell hardness 22, and shrinkage of 0.0001 in. per in.

BRONZE ALLOY—*The Riverside Metal Co., Riverside, N. J.* Mixture 44 is a special bronze alloy of high lead content but made without zinc, which is said to have high machinability.



SILICONE RUBBER—*The Stalwart Rubber Co., 218 Northfield Road, Bedford, Ohio.* X-6 silicone rubber for low-temperature applications can now be furnished in gaskets, diaphragms, sleeves, packings, channels, and other molded, extruded, punched, and die- or lathe-cut rubber parts.

RUBBER STOCK—*The Stalwart Rubber Co., 218 Northfield Road, Bedford, Ohio.* Molded, extruded, punched, and lathe-cut rubber parts are being fabricated from No. 250 silicone rubber stock. This material is recommended for application requiring good mechanical strength and resilience at temperatures below —50 F.

SYNTHETIC RUBBER COMPOUNDS—*The Stalwart Rubber Co., 218 Northfield Rd., Bedford Ohio.* Synthetic rubber compounds resist the chemical action of petroleum products, their derivatives, and other industrial and commercial lubricants.

SILICONE RUBBER—*The Stalwart Rubber Co., 218 Northfield Road, Bedford, Ohio.* Silicone rubber can be bonded to a wide range of metals. Development is recommended for such applications as gaskets on industrial ovens and commercial defreeze units.

SILICONE RUBBER—*The Stalwart Rubber Co., 218 Northfield Road, Bedford, Ohio.* X-7 silicone rubber is said to have better than twice the resistance to permanent compression and somewhat greater tensile strength than former types of silicone rubber.

SPATTER-PROOF COMPOUND — *G. W. Smith & Sons, Inc., 5400 Kemp Road, Dayton 5, Ohio.* Applied by brush, spray, or dipping, Protect-O-Metal No. 8 dries in less than an hour to a thin transparent coating that prevents rust for 6 months.

PLASTIC—*The Formica Co., Cincinnati 32, Ohio.* Laminated plastic, RN-30, is for gears, cams, pinions, bearings, and similar industrial applications.

NYLON ROD—*The Polymer Corp., 201 Ganster Bldg., Reading, Pa.* Wear resistance combined with seating qualities make this rod useful for machining into valve disks. FM-3001 nylon is flexible to conform exactly to the valve's seating surface.

COATING — *Brooklyn Varnish Mfg. Co., Inc., 50 Jay St., Brooklyn 1, N. Y.* Tuf-On No. 82 clear coating, for fiber protection, fills the pores and inhibits absorption of fats, oils, and greases, and acts as a sealer against perspiration and moisture.

LIQUID CASTING PLASTIC—*Marco Chemicals, Inc., Sewaren, N. J.* Marcokit No. 249, surface-checking kits contain a pint of casting resin and the proper amount of catalyst to cause the resin to solidify in approximately 15 min.

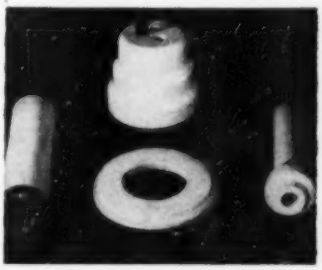
PROTECTIVE CASTING—*Chemclean Products Corp., 6½ Sixth Ave., New York 13, N. Y.* Chem-Peel is a plastic emulsion that can be applied either by spraying or dipping and imparts to the surface so treated a film of plastic which can be removed by simply peeling.

PLASTIC FOAM—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* Plastic foam expands to 100 times its original volume when baked. The insulating material is lighter than some gases.

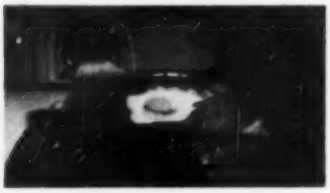
PROTECTIVE COAT — *The U.S. Stoneware Co., Akron, Ohio.* Developed as an easily applied protective coating to resist corrosive conditions not sufficiently severe to warrant application of multiple coat series of Tygon Paints, the Series "K" Tygon paint coating is a self-priming vinyl base that adheres to metal, wood, or concrete.

PLASTIC COATING — *Black Ox Chemical Co., Newark, N. J.* Krylon plastic coating is said to reduce the number of processes required to prevent rust and corrosion on metal stampings such as camera and radio parts.

FOAM SEALS—*Oakite Products Inc., 22 Thames St., New York 6, N. Y.* Oakite composition No. 38, Fume-Seal, produces a dense foam blanket which seals acid pickling solutions in evolved gases. It is said to be extremely stable in highly acetic solutions.



CERAMICS—*Coors Div., of Landes, Zachery and Peterson, 272 S. Santa Fe Drive, Denver 9, Colo.* Properties of these high-strength industrial ceramics make them naturals for mechanical parts where corrosion, wear, friction, or high temperature affect the durability of materials.



COATED FABRIC—*W. A. Plummer Mfg. Co., 752 S. San Pedro St., Los Angeles 14, Calif.* Plummite is a high-temperature (500 F) coated fabric, durable enough to resist repeated handling and flexing.

MAGNET MATERIALS — *General Electric Co., Pittsfield, Mass.* Specifically for application where a high demagnetization force is present G-E Alnico 7 is recommended for use in motors, generators, and variable air-gap devices.

MOLDING POWDERS—*General Electric Co., Chemical Dept., Pittsfield, Mass.* General-purpose phenolic molding powders are wood flour-filled materials, priced an average one cent per lb below the market price of other general-purpose molding powders.

THERMOSETTING RESIN — *Armstrong Products Co., 391 N. Broadway, Burket, Ind.* Adhesive A-1 joins metals, glass ceramics, plastics, wood, and other rigid materials to themselves and to each other.

PACKING MATERIAL—*Crane Packing Co., 1800 Cuyler, Chicago, Ill.* Chemlon is a chemically inert packing material and is available in a wide variety of shapes in molded form. It is resistant to acids or alkalis and is effective to 450 F.

INSULATING RESIN—*General Electric Co., Pittsfield, Mass.* Silicone insulating material is designed to enable electrical equipment to operate at temperatures as high as 180 C.

COATINGS—*Felt Products Mfg. Co., 1508 Carroll Ave., Chicago 7, Ill.* Felseal coatings can be applied to any fibrous-type base material in film thicknesses of 0.001 to 0.005 in.

HAND CREAM—*Chase Chemical Co., Cleveland, Ohio.* Industrial protective hand cream protects skin against paints, printing ink, lacquers, grease, grime, and oil. Glov-Cote contains no harmful wax fillers.

PATTERN PLASTIC—*ARC Corp., 70 Pine St., New York 5, N. Y.* Ard-Lustrex 15X is for precision casting and can be molded in cast molds that cost no more than wax-mold equipment.

FINISHES—*E. I du Pont de Nemours & Co. Inc., Wilmington 98, Del.* Telfon Tetrafluoroethylene resin, produced as a suspensoid, provides tough spray finishes, enamels for insulating fine electric wire, compounds for extruding heavier insulation onto wire, and unsupported films, and tapes.

CASTING SEAL — *Chemical Dept., General Electric Co., Pittsfield, Mass.* Shorter baking time, good core permeability, and collapsibility are provided by a new liquid resin for sealing porous light-metal castings.

FILTER CLOTH—*John A. Roebling's Sons Co., Woven Wire Fabrics Div., Trenton 2, N. J.* Resistance to severe chemical corrosion is a main fetaure of this wire filter cloth. Hastelloy alloys are high-strength, nickel-base alloys that withstand action of nearly all acids over a wide range of temperatures and concentrations.

GASKETING MATERIAL—*Products Research Co., 5426 San Fernando, Glendale, Calif.* Zinc-chromate impregnated gasketing material is called Chrome Lock. It is available in tapes, sheets, or stampings.

TUNGSTEN POWDERS—*Sylvania Electric Products Inc., Towanda, Pa.* Fine tungsten powders with precise and predictable particle size and distribution are for the critical requirements of tungsten-carbide toolmakers.

DRI-SPRAY—*Payne and Craig Corp., 82 Beekman St., New York 7, N. Y.* Craig Dri-Spray applies at low pressure individually separated and aerated dry-powder particles for dusting operations with even and uniform distribution and without flotation.

DIELECTRIC MATERIAL—*Henry L. Crowley & Co. Inc., 1 Central Ave., West Orange, N. J.* Crothane, a dielectric material, can be supplied in flat plates or in tubes, held to an OD or ID ±0.0015 in. at no extra cost.

NON-SCALING COMPOUND—*Parker Stamp Works, Inc., 690 Franklin Ave., Hartford, Conn.* Phoenix Brand non-scaling compound is said to virtually eliminate decarburization, scaling, pitting, surface film, and excessive discoloration during heat-treating of steels.

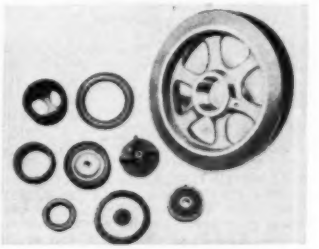
ALUMINUM—*Salkover Metal Processing, 321 Dixie Terminal Bldg., Cincinnati 2, Ohio.* Method of brazing aluminum to steel offers great strength and broad adaptability. Technique is said to be simple and low in cost.

STAINLESS-WIRE DRAWING—*Magnus Chemical Co. Inc., Metal Coatings Div., Garwood, N. J.* Method of drawing stainless steel wire eliminates the use of lead coating.

BATCH IMMERSION METHOD — *Western Sealant Inc., Culver City, Calif.* Bonding dissimilar materials in parts designed to withstand extreme lateral or internal hydrostatic or aerostatic pressures is the aim of this process which allows numerous parts to be processed simultaneously.

ROLLED GOLD PLATES — *The American Silver Co., Inc., Flushing, N. Y.* The ASC Inter-Weld process involves welding the gold layer to a barrier layer of pure nickel and then soldering this dual thickness to the base material in the conventional manner. Rolled gold layers are said to be far tougher and longer wearing than comparable thickness of gold electroplate.

SURFACE TREATMENT — *Enthone, Inc., 442 Elm St., Dept. MHP, New Haven, Conn.* "Surprep" is a surface preparational material for cleaning aluminum, steel, and zinc surfaces prior to organic finishing. It is a liquid containing oil-displacing chemicals, said to quickly dislodge oil, grease, and other organic materials.



RUBBER-TO-METAL BONDING — *Acushnet Process Co., New Bedford, Mass.* Acushnet rubber-to-metal bonding is said to combine the best properties of metal and rubber (natural or synthetic) in one bonded unit.

DIP PROCESS—*Technical Processes Div. of Colonial Alloys Co., Philadelphia 29, Pa.* Mironizing is a dipping process for aluminum and aluminum alloys including those containing copper. The process takes 5 min and is said to produce an excellent base for paints and lacquers.

METAL ETCHING—*Ford Motor Co., Dearborn, Mich.* Cathodic vacuum etching brings out unusually clear metal flow lines which indicate the direction of the flow when forged under high pressure.

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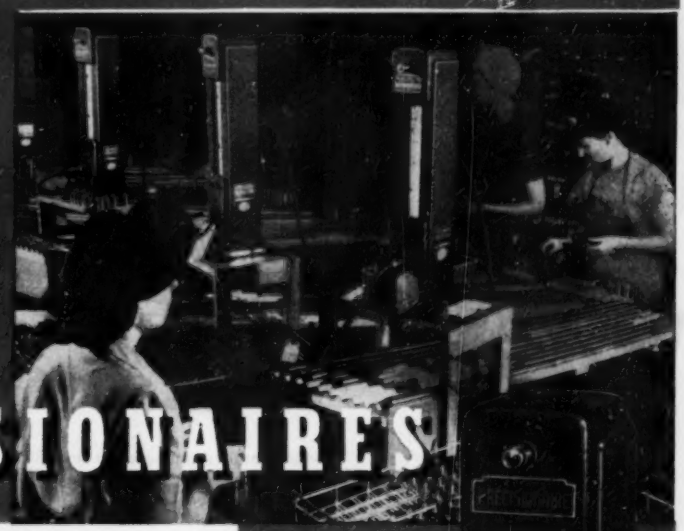

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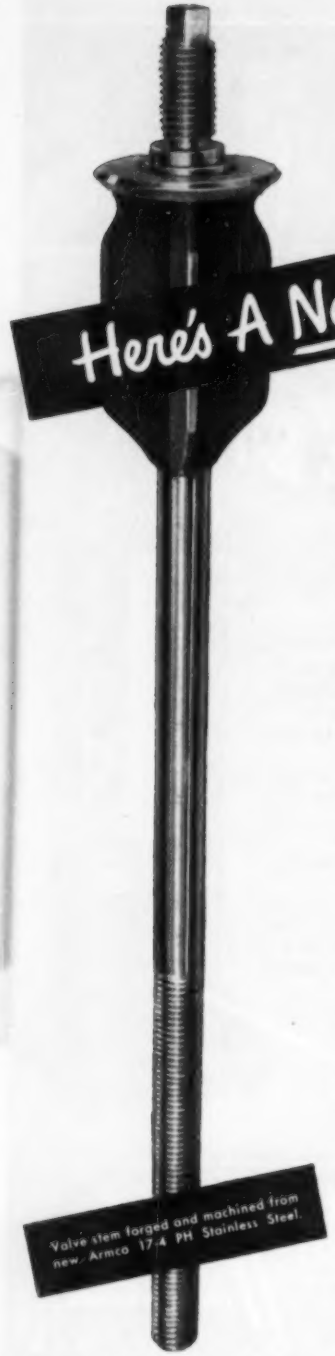


Here's A New Stainless Bar Grade

WITH 8 UNUSUAL ADVANTAGES

If your products require extra strength and hardness combined with excellent corrosion resistance, you'll be interested in the revolutionary new properties of Armco 17-4 PH Stainless Steel bars and wire.

This new precipitation hardening grade, a development of Armco Research, offers you an exceptional combination of 8 advantages:

1. It is hardenable by heat treatment to Rockwell C-40/45.
2. Hardness is obtained by heat treating in the low range of 850-900° F. for one hour, and air cooling.
3. Only a superficial, easy-to-remove heat tint results from the heating operation. This means that close tolerance parts can be finish-machined before hardening—eliminating finish machining or grinding after hardening.
4. Because of low hardening temperatures, distortion is virtually eliminated.
5. Freedom from hardening cracks.
6. Stress relieving treatment is not needed with Armco 17-4 PH.
7. Machinability is good (between Types 302 and 303) in the annealed condition; fair when the steel is fully hardened. It can be readily hot worked and has good welding properties.
8. Its corrosion resistance is close to that of Types 302, 303, and 304.

Armco 17-4 PH may be just the stainless steel you need for better product performance or to solve special fabricating problems. For complete information, just fill in and mail the handy coupon.

MAIL TODAY FOR MORE DATA

Armco Steel Corporation, 3320 Curtis Street, Middletown, Ohio

Send me complete information on Armco 17-4 PH.

NAME _____ TITLE _____

FIRM NAME _____

STREET _____

CITY _____ ZONE _____ STATE _____

ARMCO STEEL CORPORATION

3320 Curtis Street, Middletown, Ohio • Plants and Sales Offices from Coast to Coast • The Armco International Corporation, World-Wide

ARMCO

American Machinist

REFERENCE BOOK SHEET

Carbide Insert and Tool Standards . . . I

DEVELOPED BY THE CARBIDE INDUSTRY STANDARDIZATION COMMITTEE

STANDARD BRAZED TOOL INSERTS

DIMENSIONS IN INCHES			TIP NUMBER	
Thickness	Width	Length	Style 1000	Style 2000
1/16	1/8	5/16	1010	2010
	5/16	1/4	1020	2020
	1/4	1/4	1025	2025
	1/4	5/16	1030*	2030
1/32	5/16	5/16	1040	2040
	5/16	1/2	1050*	2050
	1/4	3/8	1060	2060
	1/4	1/2	1070*	2070
	5/16	3/8	1080*	2080
	3/8	3/8	1090*	2090
	3/8	1/2	1100	2100
	5/16	1/2	1105*	2105
1/8	5/16	3/4	1110*	2110
	1/4	1/2	1120*	2120
	1/4	5/8	1130	2130
	1/4	3/4	1140*	2140
	5/16	7/16	1150	2150
	5/16	1/2	1160*	2160
	5/16	5/8	1170	2170
	3/8	1/2	1180*	2180
	3/8	5/8	1190	2190
	1/2	1/2	1200*	2200
	1/2	3/4	1210**	2210
	3/4	3/4	1215**	2215
5/32	3/8	9/16	1220	2220
	3/8	3/4	1230	2230
	5/8	5/8	1240*	2240
3/16	5/16	7/16	1250	2250
	5/16	9/16	1260*	2260
	3/8	1/2	1270*	2270
	3/8	5/8	1280	2280
	3/8	3/4	1290	2290
	7/16	5/8	1300	2300
	7/16	13/16	1310	2310
	1/2	1/2	1320*	2320
	1/2	3/4	1330**	2330
	1/2	3/4	1340*	2340

DIMENSIONS IN INCHES			TIP NUMBER			
Thickness	Width	Length	Style 0000	Style 1000	Style 3000	Style 4000
1/4	3/8	9/16		1350	3350	4350
	3/8	3/4		1360	3360	4360
	7/16	5/8		1370	3370	4370
	1/2	3/4	0380	1380	3380	4380
	5/8	1	0390	1390	3390	4390
	5/8	5/8		1400*	3400	4400
	3/4	3/4		1405*	3405	4405
	3/4	1	0410	1410**	3410	4410
5/16	5/16	5/8		1420	3420	4420
	3/8	11/16		1430	3430	4430
	1/2	3/4		1440**	3440	4440
	1/2	1		1450	3450	4450
	5/8	1	0460	1460**	3460	4460
	3/4	3/4		1470*	3470	4470
	3/4	1		1475**	3475	4475
	3/4	1 1/4	0480	1480**	3480	4480
3/8	1/2	3/4		1490	3490	4490
	1/2	1	0500	1500	3500	4500
	5/8	1	0510	1510**	3510	4510
	3/4	1 1/4		1520**	3520	4520
	3/4	1 1/2	0525	1525	3525	4525
1/2	3/4	1		1530	3530	4530
	3/4	1 1/4	0540	1540**	3540	4540
	3/4	1 1/2	0550	1550	3550	4550

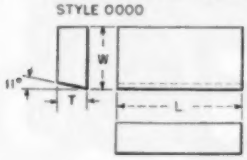
Tolerances:
+0.015 —0.000 on all tip dimensions up to 3/4 in.
+0.020 —0.000 on all tip dimensions over 3/4 in. through 1 in.
+0.040 —0.000 on all tip dimensions over 1 in. through 2 in.

*Extra grinding stock on width to permit grinding on both sides.
**Extra grinding stock on length to permit grinding on both ends.

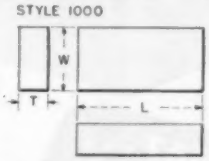
STYLES 5000 AND 6000 INSERTS

TIP NUMBER	TIP DIMENSIONS			TIP NUMBER	TIP DIMENSIONS		
	T	W	L		T	W	L
5030	1/16	1/4	5/16	6080	3/32	5/16	3/8
5080	5/32	5/16	3/8	6100	3/32	3/8	1/2
5100	5/32	3/8	1/2	6200	1/8	1/2	1/2
5105	5/32	7/16	1/2	6240	5/32	5/8	5/8
5200	1/8	1/2	1/2	6340	7/16	3/4	3/4
5240	5/32	5/8	5/8				
5340	3/16	3/4	3/4				
5410	1/4	3/4	1				

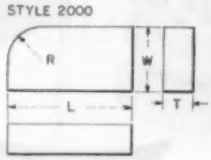
STYLE 0000



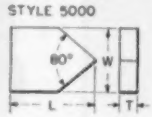
STYLE 1000



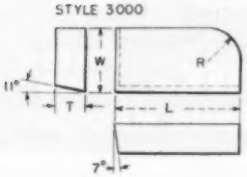
STYLE 2000



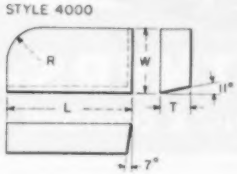
STYLE 5000



STYLE 3000



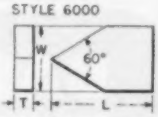
STYLE 4000



TIP RADII
Styles 2000, 3000 and 4000

WIDTH	RADII
1/8 through 1/4	1/32
5/16 through 7/8	3/64
Over 7/8	1/16

STYLE 6000



New BAKER

cuts operation time FROM 90 MINUTES TO LESS THAN 5 MINUTES PER PIECE

Boring, reaming, threading and counterboring operations on pipe flanges are accomplished in rapid succession with the new Baker 30H04 Boring and Threading Machine. All four operations are performed with reamer counterbore cutters and chasers in a specially adapted "Murchey" Full Receding Pipe Tap at one pass. Machine has lead screw feeding attachment. The work was previously done with a single point tool with work rotating.

You too, can cut your production costs through *greater productivity*. Consult Baker engineers regarding your specific problem. Replace the old method with a time saving, cost cutting Baker Special Machine.

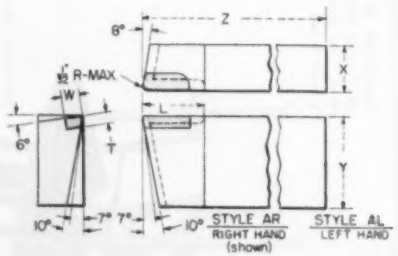
SINCE 1867 . . .

BAKER BROTHERS – Inc. TOLEDO OHIO

DRILLING, TAPPING, KEYSEATING & CONTOUR GRINDING MACHINES

Carbide Insert and Tool Standards . . . II

TERMINOLOGY FOR STANDARD BRAZED TOOLS



General Specifications

Unless otherwise specified by purchaser, the following tolerances apply to all standard and special carbide tipped cutting tools:

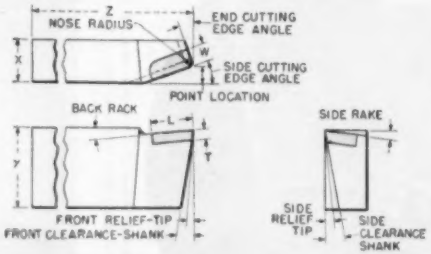
TIP:

End Cutting Edge Angle.....Plus or minus 1°
Side Cutting Edge Angle.....Plus or minus 1°
Side Relief.....Plus or minus 1°
Front Relief.....Plus or minus 1°
Back Rake.....Plus or minus 2°
Side Rake.....Plus or minus 2°
Nose Radius.....Maximum 1/32"
Point Location.....Plus or minus 1/64"
Tip Thickness—T.....Plus or minus 1/64"
Tip Width—W.....Plus or minus 1/64"
Tip Length—L.....Plus or minus 1/64"

SHANK:

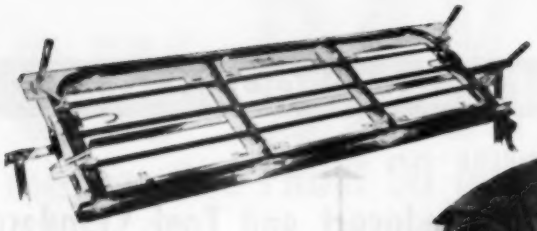
Front Clearance.....Plus or minus 1°
Side Clearance.....Plus or minus 1°
Shank Thickness—X.....1" or less.... + .000 — .010
Over 1" .... + .000 — .015
Shank Width—Y.....1" or less.... + .000 — .010
Over 1" .... + .000 — .015
Shank Length—Z.....Up to 1" square &
1 x 1¼ .... ±⅜
Over 1" square &
over 1 x 1¼ ±¾

STYLE A BRAZED TOOLS *END-CUTTING EDGE* ANGLE = 0°



Dimensions of Style AR and AL Brazed Tools

CATALOG NUMBER		SHANK DIMENSIONS			TIP CATALOG NUMBER
Style AR	Style AL	Width X	Height Y	Length Z	
AR 4	AL 4	¼	¼	1½	2040
AR 5	AL 5	5/16	5/16	2¼	2070
AR 6	AL 6	⅜	⅜	2½	2070
AR 7	AL 7	7/16	7/16	3	2070
AR 8	AL 8	½	½	3½	2170
AR 10	AL 10	⅝	⅝	4	2230
AR 12	AL 12	¾	¾	4½	2310
AR 16	AL 16	1	1	7	3390 4390
AR 20	AL 20	1¼	1¼	8	3460 4460
AR 24	AL 24	1½	1½	8	3510 4510
AR 44	AL 44	½	1	7	2260
AR 54	AL 54	⅝	1	6	3360 4360
AR 55	AL 55	⅝	1¼	8	3360 4360
AR 64	AL 64	¾	1	6	3380 4380
AR 66	AL 66	¾	1½	8	3430 4430
AR 85	AL 85	1	1¼	8	3460 4460
AR 86	AL 86	1	1½	8	3510 4510
AR 88	AL 88	1	2	10	3510 4510
AR 90	AL 90	1½	2	8	3540 4540



Safety slide for hospital bed. 42 half-inch long tack welds plus 6 continuous welds are made on .042" cold rolled steel in 23 minutes, including assembly time.

SIMMONS STEEL FURNITURE *is Braze Welded*

Bedside cabinet. 2 reinforcing welds, 2 inches long, are made on 20-gage cold rolled steel in 54 seconds.

PRODUCT IS STRONGER

ASSEMBLY IS FASTER

COSTS ARE LOWER

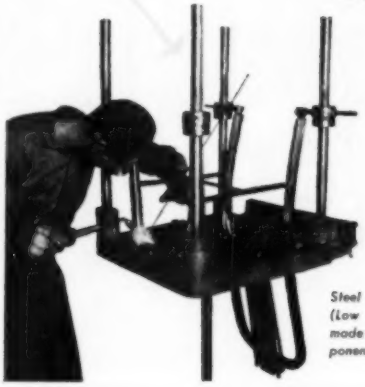
COMPARATIVE SAVINGS:
Using ANACONDA 997 (Low Fuming) Bronze versus steel welding rod on same operations

40 to 60%

Steel dresser. 36 welds are made on 20- and 22-gage cold rolled steel. Total time, including assembly, is less than 6 minutes.

The Simmons Company adds: "Under actual testing, we have a much stronger unit today than if we were using steel welding, due to the fact that the lower bronze-welding temperatures do not weaken the joint areas."

If you do either production or repair welding, write for Publication B-13. It covers *all* ANACONDA Welding Rods, their applications and procedures for their use. The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.



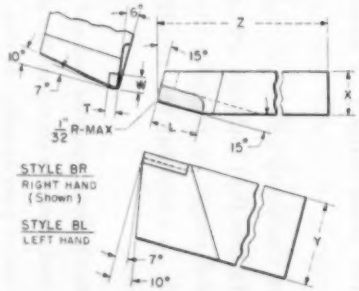
Steel chair. 56 ANACONDA 997 (Low Fuming) Bronze welds are made on each chair, with components aligned in welding fixture.

You can depend on

ANACONDA

STYLE B BRAZED TOOLS

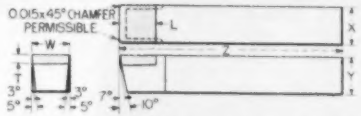
END CUTTING EDGE ANGLE = 15°



Dimensions of Style BR and BL Brazed Tools

CATALOG NUMBER		SHANK DIMENSIONS			TIP CATALOG NUMBER
Style BR	Style BL	Width X	Height Y	Length Z	
BR 6	BL 6	3/8	3/8	2 1/2	1070
BR 8	BL 8	1/2	1/2	3 1/2	2170
BR 10	BL 10	5/8	5/8	4	2320
BR 12	BL 12	3/4	3/4	4 1/2	2310
BR 16	BL 16	1	1	7	3390
					4390
BR 20	BL 20	1 1/4	1 1/4	8	3460
					4460
BR 24	BL 24	1 1/2	1 1/2	8	3510
					4510
BR 44	BL 44	1/2	1	7	2260
BR 54	BL 54	5/8	1	6	3360
					4360
BR 55	BL 55	5/8	1 1/4	8	3360
					4360
BR 64	BL 64	3/4	1	6	3380
					4380
BR 66	BL 66	3/4	1 1/2	8	3430
					4430
BR 85	BL 85	1	1 1/4	8	3460
					4460
BR 86	BL 86	1	1 1/2	8	3510
					4510
BR 88	BL 88	1	2	10	3510
					4510
BR 90	BL 90	1 1/2	2	8	3540
					4540

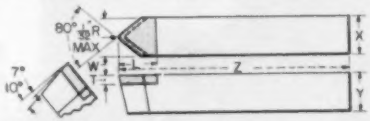
STYLE C BRAZED TOOLS *SQUARE END-CUTTING*



Dimensions of Style C Brazed Tools

CATALOG NUMBER	SHANK DIMENSIONS			TAP CATALOG NUMBER
	Width X	Height Y	Length Z	
C 4	1/4	1/4	1 1/2	1030
C 5	5/16	5/16	2 1/4	1080
C 6	3/8	3/8	2 1/2	1090
C 7	7/16	7/16	3	1105
C 8	1/2	1/2	3 1/2	1200
C 10	5/8	5/8	4	1240
C 12	3/4	3/4	4 1/2	1340
C 16	1	1	7	1410
C 20	1 1/4	1 1/4	8	1480
C 44	1/2	1	7	1320
C 54	5/8	1	6	1400
C 55	5/8	1 1/4	8	1400
C 64	3/4	1	6	1405
C 66	3/4	1 1/2	8	1470
C 86	1	1 1/2	8	1475

STYLE D BRAZED TOOLS *80° NOSE ANGLE*



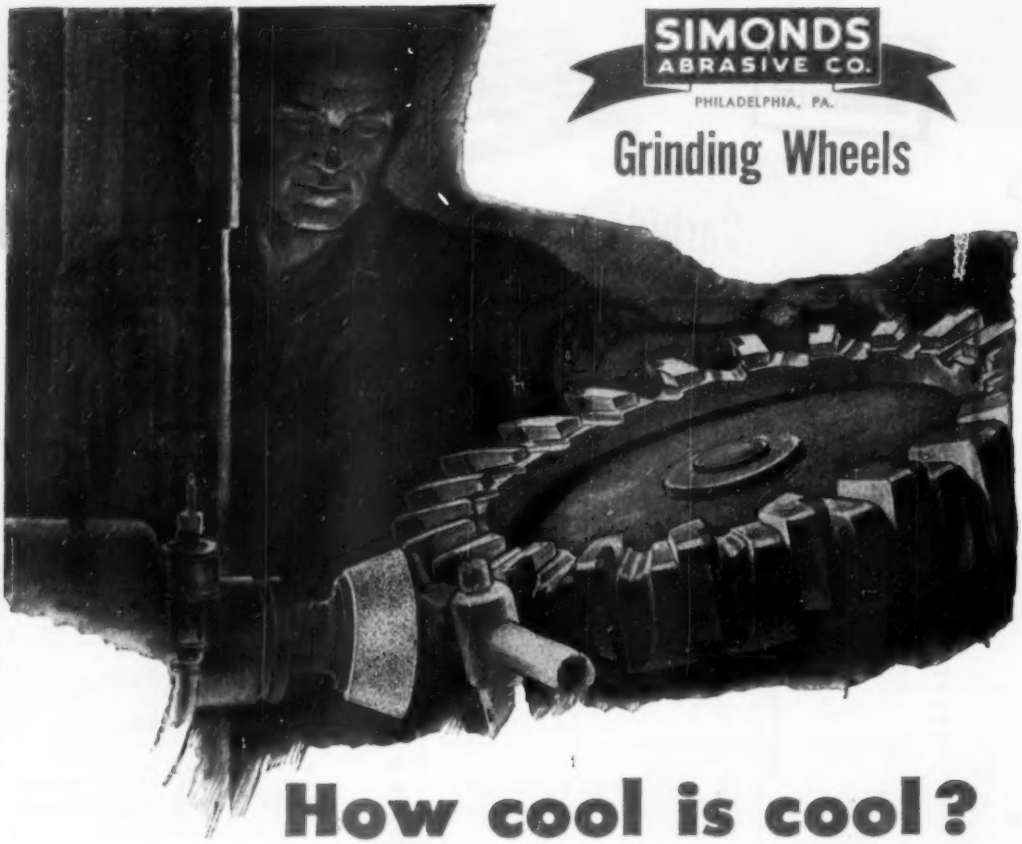
Dimensions of Style D Brazed Tools

CATALOG NUMBER	SHANK DIMENSIONS			TIP CATALOG NUMBER
	Width X	Height Y	Length Z	
D 4	1/4	1/4	1 1/2	5030
D 5	5/16	5/16	2 1/4	5080
D 6	3/8	3/8	2 1/2	5100
D 7	7/16	7/16	3	5105
D 8	1/2	1/2	3 1/2	5200
D 10	5/8	5/8	4	5240
D 12	3/4	3/4	4 1/2	5340
D 16	1	1	7	5410

American Machinist

Carbide Insert and Tool Standards . . . III

REFERENCE BOOK SHEET



SIMONDS
ABRASIVE CO.
PHILADELPHIA, PA.

Grinding Wheels

How cool is cool?

In grinding, the answer is frequently a matter of temper as well as temperature . . . demanding careful wheel selection for cool, non-burning action that will not draw temper or damage the work.

Simonds Abrasive Company offers you this selection in a complete line that includes wheels right in grade, size and shape to prolong the life of your cutting tools . . . and for top results on all your grinding jobs.

Our free data book lists specific wheel recommendations and includes the name of the distributor equipped to serve you locally. Write.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. DISTRIBUTORS IN PRINCIPAL CITIES

NEWS OF METALWORKING

Big Boost in Military Procurement of Hardgoods Items

1951 Budget Calls for Increases Over 1950

WASHINGTON — Hardgoods producers can look for some significant increases in military procurement in their fields next year, if the fiscal 1951 budget for the military goes through Congress "As is." Soft and housekeeping goods producers will see a heavy drop in that type procurement.

Under the $13 billion budget, designed by the White House and the Pentagon, procurement of many hard items would be increased over the present level, even though the 1950 fiscal appropriation is almost $2 billion more than the one projected for next year.

Largest cut in procurement will come in the maintenance and operation category, such items as paint, hardware, light bulbs, fuel, and spare parts. This is directly due to the heavy reduction in the number of posts, camps and stations maintained by the armed forces. Almost a billion dollars, budget wise, will be saved through these reductions. Much of the saving will be plowed back into arms and equipment.

The increases in the hardgoods items are very significant. The $32,100,000 increase for "ammunition" points toward the rocket and guided missile field, where prototypes have been appearing thick and fast lately.

The $40,000,000 increase in the "miscellaneous" category will go, for the most part, into communications equipment. The $3,900,000 increase in heavy materials handling equipment will go for cranes, lift trucks, conveyors, and the like.

At first glance the cut in aircraft procurement ($155 million) seems a blow to that industry. But, a second glance at the money going into rocket and kindred projects, plus the fact that a lot of the 1950 aircraft money hasn't been put to work yet, shows that things are not so tough for aircraft people after all.

The only real blow, budgetwise, will be experienced by ship builders, who still have a big backlog of jobs to carry over from appropriations of previous years.

Couple the procurement reflected in this budget with the outlay to be made this and next year for foreign arms aid (about $2.2 billion) and the hardgoods manufacturers have some big years ahead.

A study of the table below will show what classes of items will be procured, and the levels of next year and this year.

Item	1951	1950	Change
Aircraft	$2.017 Billion	$2.182 Billion	Down 155 Million
Ships	None	56.5 Million	Down 56.5 Million
Weapons (Guns, tanks, fire direction control apparatus, etc.)	150 Million	149.6 Million	Up 400 Thousand
Ammunition (Guided missiles, torpedoes, and other ammunition)	200 Million	167.9 Million	Up 32.1 Million
Vehicles	108 Million	107.7 Million	Up 300 Thousand
Railroad Equipment	500 Thousand	1.2 Million	Down 700 Thousand
Construction Equipment	7.5 Million	8.2 Million	Down 700 Thousand
Heavy Materials Handling Equipment	7.0 Million	3.1 Million	Up 3.9 Million
Miscellaneous Hard Goods (Communications equipt, other)	276.0 Million	236.0 Million	Up 40 Million
Maintenance and Operation (Housekeeping items, fuel, services)	3.4 Billion	3.6 Billion	Down 200 Million
Major Procurement for Civilian Components (Except Aircraft)	40.0 Million	55.5 Million	Down 15.5 Million
Procurement for War Reserves (Long lead time materiel)	None	33.1 Million	Down 33.1 Million
Research and Development	594 Million	586.6 Million	Up 7.4 Million

James Zeder, Chrysler Engineering Head, Elected President of SAE for New Year

DETROIT—James C. Zeder, chairman of the Engineering Board of Chrysler Corp., has been elected president of the Society of Automotive Engineers for 1950.

Elected vice presidents, representing various activities, were: Raymond D. Kelly, United Air Lines, air transport; Harold D. Hoekstra, Civil Aeronautics Administration, aircraft; Wright A. Parkins, Pratt & Whitney Aircraft, aircraft powerplant; Rex A. Terry, Chrysler Corp., body; Albert H. Fox, Standard Oil Co. of Indiana, diesel engine; Roy W. Roush, Timken-Detroit Axle Co., engineering materials; Arthur O. Willey, Lubrizol Corp., fuels and lubricants; Edward N. Cole, Cadillac Motor Car Div., GMC, passenger car; Robert F. Steeneck, Fafnir Bearing Co., production; Wayne H. Worthington, John Deere Waterloo Tractor Works, tractor and farm machinery; Matt E. Nuttila, Cities Service Oil Co., transportation and maintenance; William P. Michell, Spicer Mfg., Div. of Dana Corp., truck and bus activity.

William E. Conway, Studebaker Corp.; Philip J. Kent, Chrysler Corp., and Dale Roeder, Ford Motor Co., are the three new councilors.

R. J. S. Pigott, Gulf Research & Development Co., and S. W. Sparrow, Studebaker Corp., stay on the council as past presidents. All activity-vice presidents also serve on the council.

***NEW SAE HEAD** is James C. Zeder, chairman of the Enginering Board, of Chrysler Corp., who took office Jan. 11 at the annual meeting of the Society of Automotive Engineers in Detroit*

Good Year Ahead for Machinery, Commerce Dept. Predicts

Upturn in Machine Tool Output Forecast for '50

WASHINGTON—A good 1950 for most of the industries which produce machinery and transportation equipment is predicted by the U.S. Dept. of Commerce.

In an analysis of machinery and land transportation equipment industries in 1949, and an evaluation of prospects in these industries in 1950, the Machinery and Transportation Div. of the Office of Domestic Commerce estimated that their value of production in 1950 would approximate $19.0 billion of machinery and parts, and $9.3 billion of vehicles and parts.

While somewhat below the 1949 production, estimated at $20.1 billion and $10.7 billion respectively, the totals for 1950 are expected to compare favorably with the $19.1 billion production of machinery and $9.0 billion of transportation equipment reported in the 1947 Census of Manufactures.

Of the anticipated 1950 machinery production of $19.0 billion, $10.5 billion is of industrial machinery (except electrical), $6.8 billion of electrical machinery and apparatus, and electronic devices and controls, and $1.7 billion of farm machines and tractors. Of the 1950 production of land transportation equipment totaling $9.3 billion, $8.8 billion is predicted for the automotive industry, and $0.5 billion of railway locomotives and cars.

An upward trend in the production of industrial machinery (except electrical) which began in the last quarter of 1949 after a decline in the second and third quarters is expected to continue into early 1950 with production for the year approximating the $10.6 billion reached in 1949.

See Upturn in Machine Tools

In machine tools, ODC commodity analysts expect production to turn upward in 1950, with the annual output reaching a value of $300 million compared with a 1949 value of $248 million. Production of excavating and earthmoving equipment should equal that of 1949's $470 million.

In electrical machinery and apparatus a generally declining trend in 1949 is expected to continue in 1950. Production of heavy electrical machinery however will continue about as in 1949. An increased demand is anticipated for electronic equipment.

In the automotive field, ODC analysts said it was unlikely that 1949 production would either be equalled or exceeded in the next few years. They estimated that from five to five-and-a-half million units would be produced in 1950, or about 15% below 1949.

Drop in Farm Machinery

In farm machinery and tractors, the physical volume of production in 1950 is expected to approximate that of 1947, three times the average output for 1935-39. However, production in 1950 is expected to drop 15% below the $2 billion production in 1949.

In railway equipment, it is expected that 2,500 locomotive units will be ordered in 1950 at an approximate value of $330 million. Deliveries are expected to have an approximate value of $250 million. In 1949, total production was valued at $226 million.

It is estimated that $2,500 freight cars will be ordered in 1950, having a value of $195 million as compared with 4,500 cars ordered in 1949, and 94,691 in 1948.

Approximately 275 passenger cars are expected to be ordered in 1950 for domestic use as compared with 145 cars in 1949, and 517 in 1948.

In shipbuilding, Office of Domestic Commerce analysts said that about 682,000 gross tons of shipping would probably be completed in 1950, a decline of 12% from 1949. Dollar values for this industry are not available.

New Tool Orders Delayed

Uncertainties introduced by the steel and coal strikes in 1949 resulted in postponement of orders for new machine tools, which will probably be placed during 1950, the ODC report stated.

Export trade amounted to more than 25% of shipments during 1949.

***CLAYTON R. BURT**, president, Potter & Johnston Machine Co. and one of the best known American machine tool builders, was honored recently on his 75th birthday at a dinner given by officials of Pratt & Whitney, Division Niles-Bement-Pond Co., of which Potter & Johnston is a subsidiary. He was the guest the preceding evening of the foremen of Pratt & Whitney, of which Mr. Burt was president for many years. Mr. Burt is a native of Lynn, Mass., and learned the machinist's trade at the Brown & Sharpe Mfg. Co. He was associated with Pratt & Whitney and Niles-Bement-Pond for about 25 years in an executive capacity, finally serving as chairman of the board*

Regular Equipment Checkups Urged As Sure Way to Eliminate Waste in Plants

CLEVELAND—Regularly scheduled checkups on all equipment "are the surest way to eliminate waste in the majority of plants that are required to operate on regular production schedules week in and week out without shut-down periods," it was declared by H. Hardenbrook, general works engineer, Buick Motor Div., General Motors Corp., speaking at the first national Plant Maintenance Show held here Jan. 16-19.

He was one of many speakers who talked on various phases of plant maintenance at the meetings which were under the general chairmanship of L. C. Morrow, editor of *Factory Management & Maintenance*.

Other speakers were J. E. Sutherland, MacDonald Bros., Inc., Detroit, "How Much Does Maintenance Cost?"; Albert Ramond, Albert Ramond & Associates, Chicago, "How Much Should Maintenance Cost?"; Lyman A. Darling, E. I. duPont de Nemours & Co., Wilmington, Del., "Budgeting the Maintenance Operation"; R. M. Smart, Sylvania Electric Products, Cleveland, "Selection and Upkeep of Lighting Equipment"; R. J. Teetsell, Westinghouse Electric Corp., E. Pittsburgh, "Using Electrical Instruments in Maintenance"; C. E. Egeler, General Electric Co., Nela Park, Cleveland, "The Relationship of Lighting and Color to Production"; Harold M. Ericksen, Nash Kelvinator Corp., Detroit, "The Importance of Maintenance to Safety."

A panel session Jan. 18 on "Preventive Maintenance as It Is Influenced by Proper and Improved Lubrication Practice" was led by E. Ralph Harris, Stewart-Warner Corp., Chicago, and included the following: C. L. Pope, Eastman Kodak Co., Rochester; G. L. Sumner, Westinghouse Electric Corp.; L. A. Danse, General Motors Corp., Detroit; Charles Pritchard, Republic Steel Corp., Cleveland; O. L. Maag, Timken Roller Bearing Co., Canton.

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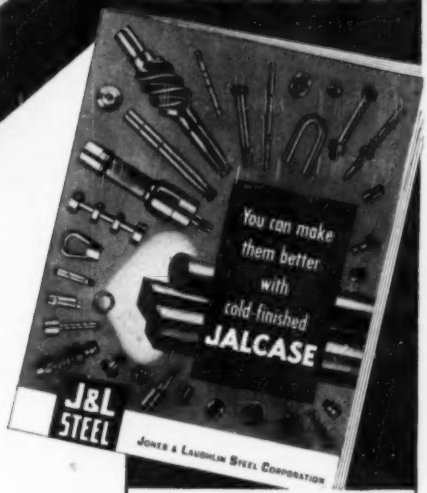

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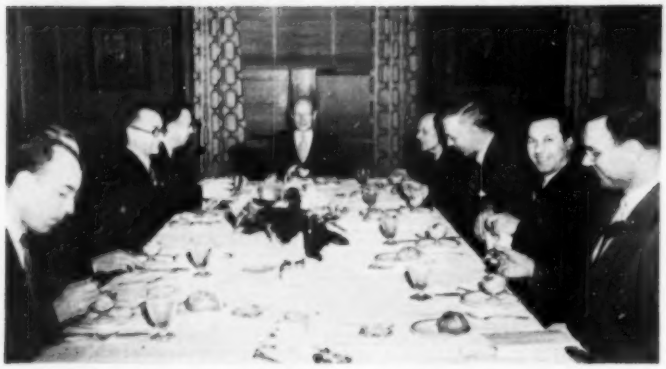


***FRENCH MACHINE TOOL** Productivity Team members were luncheon guests of AMERICAN MACHINIST Jan. 6. Those present included (reading clockwise from left) Harry Wharen, editor, McGraw-Hill Digest; Dexter Keezer, director, McGraw-Hill Dept. of Economics; Louis Champetier, director, machine tools experimental station, French Ministry of Industry and Commerce; William Sweeney, ECA project manager; Burnham Finney, editor, AMERICAN MACHINIST; Leon Huré, general manager and chairman, Leon Huré & Co., Paris; Eugene Warner, vice president and general manager, McGraw-Hill International Corp.; R. Bregeon, adjuster, Ateliers Precis; Lionel Holmes, A.M. news editor*

French Machine Tool Productivity Team Returns With U. S. 'Know-How'

NEW YORK — Production "know how" obtained in visits to American machine tool plants by a visiting French productivity team is expected to stimulate France's industrial output and revitalize her machine tool industry.

As guests of AMERICAN MACHINIST at a luncheon Jan. 6 in the McGraw-Hill Bldg. here, the leader and two members of the ECA-sponsored team told of impressions obtained on the six-week visit in this country, and compared the machine tool industry here and in France.

The three were, Louis Champetier, leader of the productivity team, and director, machine tools experimental station, French Ministry of Industry and Commerce; Leon Huré, general manager and chairman of board, Leon Huré & Co.; and R. Bregeon, adjuster, Ateliers Precis. With them was William Sweeney, ECA project manager, who guided the productivity team in the visits around the country.

American machine tools have played an important production role in the postwar industrial growth of France, it was pointed out. M. Huré the senior member of the French team, cited one instance of this importance. In 1946-47, he said, his company, which manufacturers milling machines, spent 30 million francs for new machines—all American but one—to obtain greater production economies. "If I hadn't spent that I would have had to close up shop."

Most of the business of the French machine tool industry comes from inside France, very little from outside, M. Champetier said. And right now, he added, France hasn't much of an export problem because the French market will absorb all machines now produced.

Germany Making Inroads

Some inroads in France's domestic market are being made by Germany, it was noted. "The Germans are quite active in seeking our machine tool business," M. Huré stated, adding that their prices are very low.

France makes very few special tools, M. Champetier said. The concentration is on standard machines. "We don't make special machine tools because we have no customers for them."

The United States may see a sample of what France can turn out if M. Huré's firm is able to complete a new milling machine, involving a new principle, in time for exhibition at the Chicago International Trade Fair, Aug. 7-19.

It was explained by M. Champetier, the productivity team leader, that the information obtained on the U.S. visit will go to the French Ministry of Industry and Commerce. A report will be published and the information given to all machine tool builders in France. It is possible, he said, that the report may be used as the basis for importation of more United States machinery.

Brazilian Govt. Assembles Trucks

RIO DE JANEIRO (McGraw-Hill World News)—The Brazilian government has gone into the business of assembling and selling trucks, and hopes one day to produce 100% Brazilian trucks.

The Fabrica Nacional de Motores (National Motor Factory), which is almost 100% government-owned, has turned out some 100 medium trucks which are basically Isotta Fraschini vehicles, imported from Italy.

Tires are Brazilian, from natural rubber. Cabs and bodies are being made in Brazil, and batteries are bought locally, along with a few other items. But mostly the truck is an Isotta Fraschini IF D-80, with 6-cylinder diesel motor, intended to carry an 8-ton load and to pull a trailer-and-load weighing 14 tons.

Plans call for gradual expansion of local manufacture so that by the end of 1951 practically everything will be made in Brazil. The Fabrica Nacional de Motores would not, however, do all the manufacturing; it would farm out much of the work to other firms in Brazil. Already some of them are producing parts.

The Isotta Fraschini truck lists at 250,000 cruzeiros ($12,500). Col. Gustavo de Faria, the plant director, says he expects to turn out 1,200 trucks annually by 1951, and believes there is a market for that many.

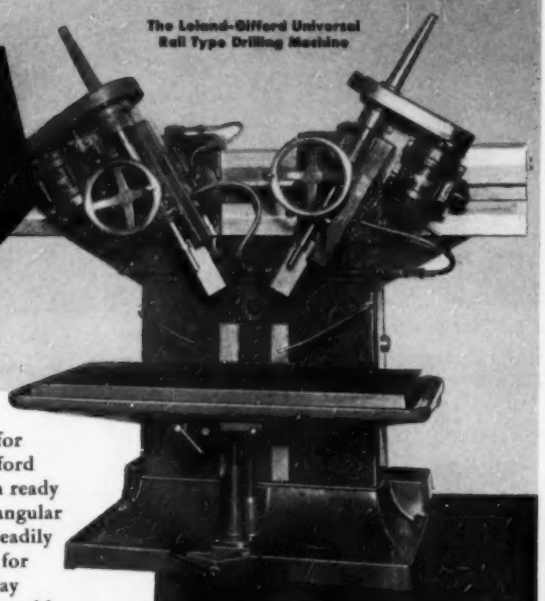
By 1951, the whole of the truck motor is to be made in Brazil, and Colonel Faria plans an output of about 2,000 motors yearly: 1,200 for the trucks, and the rest for use as marine and stationary motors, and as replacements.

Under the agreement with Isotta Fraschini, the Brazilian company will buy its parts from Isotta Fraschini only until it can get them locally. The Brazilian engineers have full liberty to alter the Isotta Fraschini design if they wish. Colonel Faria pointed out that the local factory has some new equipment which is superior to that in use in the Italian plant, and some parts may therefore be made not only different but also better and cheaper than the Italian models.

Use Pratt & Whitney Plant

The factory, constructed during the war to make Pratt & Whitney airplane motors, produced only one or two, and became a white elephant for the Brazilian government. Administrative shakeups and a switch to refrigerator production did not bring success, but the repair of Pratt & Whitney motors for Brazilian civil airlines has kept the factory open. That work will continue, and, eventually, tractor manufacturing also is planned.

FOR *DEEP ANGULAR* HOLES



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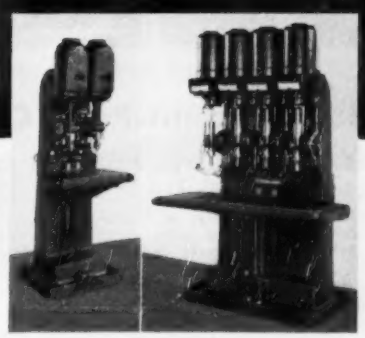
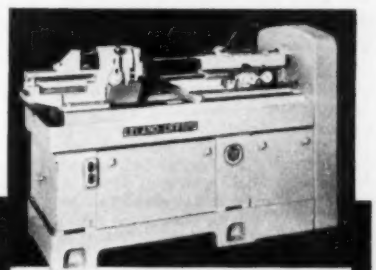


Single or Multiple Spindle Drilling Machines; Light, Medium or Heavy Duty; Hand, Power or Hydraulic Feed; for Precision Drilling or Tapping.



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William P. Kirk

Alexander H. d'Arcambal

John C. Molinar

Harry Reichert

James D. Allan

J. Potter Cunningham

Niles-Bement-Pond Changes Made William Kirk Retires as Sales Head

WEST HARTFORD, CONN. — William P. Kirk retired on Dec. 31 as vice president and sales manager, machine tools, Pratt & Whitney, Division Niles-Bement-Pond Co. He will act as a consulting engineer for the company. He has been succeeded as general sales manager by Alexander H. d'Arcambal, who has been vice president and sales manager, small tools and gages, and consulting metallurgist. Mr. d'Arcambal will have full responsibility for all sales departments of the company.

Other Sales Changes

John C. Molinar has been appointed manager of Pratt & Whitney's domestic small tool and gage sales, and Harry Reichert as manager of foreign sales. Both will report direct to Mr. d'Arcambal, as will James D. Allan, manager, Pratt & Whitney domestic machine tool sales; J. Potter Cunningham, vice president and sales manager, Potter & Johnston Co., subsidiary of Niles-Bement-Pond Co.; R. M. Johnson, manager, Chandler-Evans sales; and V. L. Howe, acting manager of advertising.

Mr. Kirk, who has been with Pratt & Whitney over 43 years, opened a branch sales office in Cincinnati in 1910 and in 1925 became sales manager of the company at Hartford, having served in that capacity ever since. He is a past president of the National Machine Tool Builders' Association. During the last war he was a member of the Machine Tool Builders' Advisory Committee and a member of the War Production Board's Machine Tools Industry Advisory Committee. Later he was on the Metalworking Equipment Industry Advisory Committee of the War Assets Corp.

Mr. d'Arcambal, associated with Pratt & Whitney for 30 years, is a past national president of the American Society for Metals and of the American Society of Tool Engineers. Mr. Molinar has been district sales manager at New York in charge of Pratt & Whitney small tools and gages.

Mr. Allan joined Pratt & Whitney in 1923 and was machinery manager of the company at Cleveland from 1927 to December, 1948, when he was moved to Hartford and engaged in general machine tool sales administration work. Mr. Reichert, educated in Europe, became associated with Pratt & Whitney in 1925 when the old Keller Mechanical Engineering Co. was taken over by the Niles-Bement-Pond Co. He has traveled widely in Europe and the Orient.

$29.5 Million For Military Aid Tools

WASHINGTON—Munitions makers in the United States will get a healthy slice of the $1-billion appropriated for military aid to North Atlantic Pact countries this year. Manufacturers of machine tools and production equipment will get comparatively little.

Of the billion dollars earmarked for European military aid, $478,309,000 will be spent for new equipment. This money will be spent in the United States. Of this, $359,399,000 will be spent for procurement of Army-type materiel. Another $82,520,000 will go for Navy-type equipment, and $36,390,000 in Airforce materiel will also be procured.

This is in addition to $362,651,000 worth of reserve weapons and materiel which the American armed forces now have in cans and which will be uncanned and shipped abroad. It will be replaced by American manufacturers in the near future, with replacement cost charged against the arms aid bill.

Only $29 Million for Machine Tools

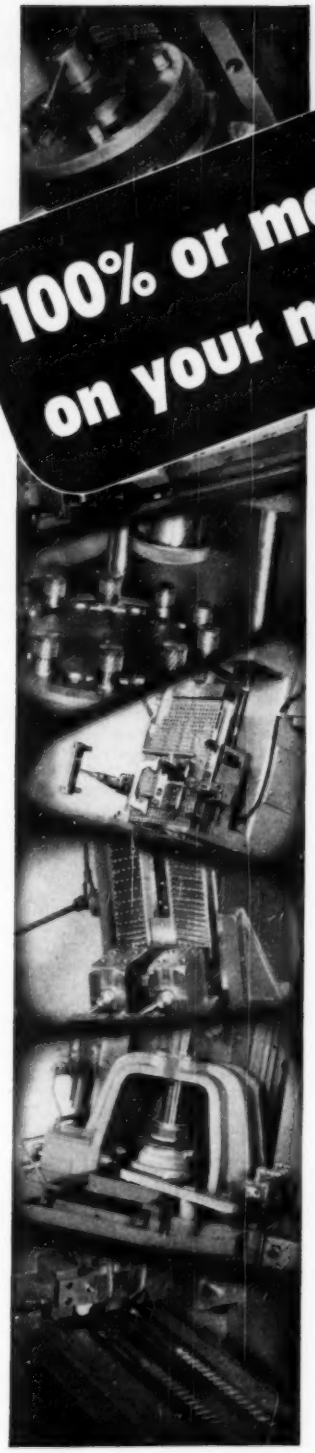
Only $85,000,000 of the billion has been budgeted for production equipment and raw materials designed to increase the munitions-making ability of the European signatories to the pact. Of this only $29,515,000 will be spent for machine tools and equipment. The rest of the money will go for the following: Steel, $5,110,000; copper, $12,908,000; aluminum, $5,155,000; other non-ferrous metals, $4,978,000; other materials, $19,959,000; and transportation charges, $7,375,000.

The go-ahead for all this procurement was the ratifying of the integrated defense plan of the North Atlantic Pact countries by the President. Congress last fall, when it passed the arms aid bill, made it necessary for the President to sanction the defense plan before the billion dollars appropriated for those countries could be released.

Arms Aid Goal Set at $11 Billion

Appropriation goal for the 1951 fiscal year in arms aid has been set at $1 billion. Although it is still too early for accurate figures on next year's breakdown of procurement, it has been strongly intimated that there will be a heavy increase in the "munitions-making equipment category."

Congress is going to have a lot to say about this billion-odd dollars set up for the second year of the arms aid program. The consensus in Washington believes that this will eventually be whittled down to around $500 million.



100% or more per year on your money . . . .

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When you get Colonial broaching equipment you get the RIGHT COMBINATION of the proper machine, and correctly designed broaches and fixtures for YOUR particular jobs—complete and ready to run.

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Detroit

WHAT WILL HAPPEN TO BABY NASH? WILLYS TO BUILD K-F ENGINE

PACKARD TO PUSH ULTRAMATIC DRIVE... FORD QUITS COACH FIELD

Primary in Detroit's current gossip agenda is what will happen to the baby Nash, built for customer reaction and shown in January at key cities from coast to coast. Nash Motors is still undecided whether it will put the $1,000 job into production (and will be until returns from 250,000 questionnaires are in) but there seems a slight inclining in favor of production.

This view, not unanimous, stems from the enthusiastic reaction of most who have seen the car and from the desire of Nash president George W. Mason to make a splash of some kind in the utilitarian transport field.

Careful study of the car indicates the remarkable possibility that it might be built with no more than five body dies. Fenders on each side would be stamped out front and rear together, then cut apart to make a pair. Thus there would be needed a die for each side, one for the door (which is reversible, punched to fit right or left hand side), one for the hood, and one for the rear deck.

Before this approach could be realized, however, some design revisions might be necessary. There is a fairly deep draw for front fenders, and the rear fenders must be drawn and formed. Whether these operations could be done with one die is a poser—but the auto industry has probably surmounted more complicated problems than that.

Meanwhile, some of the wiseacres are looking definitely dubiously at the "n.x.i." as a production piece. Their reasoning is something like this: In the first place, Nash gets a million dollars' worth of publicity out of the showings, so it can't lose even if it drops the prototype in the ashcan.

Second, Nash is coming out with a new car in a few months, priced lower than its current lines. The "n.x.i." may well function like a "loss leader" in a department store sale, intended to draw the crowd but not for sale of merchandise. There's little doubt but what the kickoff of an actual Nash a few months hence will profit in announcement interest and showroom attendance by the talk of the $1,000 car.

Test for Future Designs?

Third, each showing of the "n.x.i." has been bannered with the slogan, "There's much of tomorrow in what Nash does today." What more logical, then, say keen-witted attendants at these meetings, than to have Nash testing future design ideas for its regular line of cars with the baby car prototype? Maybe the vestigial grille, enclosed in the elliptical bumper bar, is in the designer's minds for a 1951 or 1952 Nash.

At any rate, that's what's being said—that, and the general remark that a definite specialty market exists for a car like the baby Nash. But output of 80,000 to 100,000 units a year for domestic and export? That's a question.

The rest of the January news budget is bits and pieces—an assortment that best conveys the spirit and viewpoint of Detroit today:

For the tenth year, Chevrolet's annual production went well over the million mark in domestic plants. Last year was Chevrolet's biggest yet, exceeding the previous record, set in 1929, by 19%. The 1949 totals: 1,109,958 passenger cars, 383,543 commercial cars and trucks, bringing the total to 1,493,501 units.

Buick, along with most other auto manufacturers, established new production records in 1949. Output of Dynaflow transmissions jumped from 72,971 in 1948, to 281,024 in 1949. Buick's total production was about 400,000 cars, exceeding by 82,000 units the previous record set in 1941.

Kaiser-Frazer's low-priced car will be powered by a "Supersonic" engine—nomenclature not explained—which will be produced by Willys-Overland Motors, Inc. K-F will provide additional tooling and facilities. Edgar F. Kaiser, president of K-F, said the "Supersonic" engines will deliver "remarkable performance and exceptionally high gas mileage."

Packard Expects Record Output

Ultramatic Drive will be installed on approximately 70% of all Packards produced in 1950. Packard Motor Car Company has spent more than $7-million on facilities for making the automatic transmission.

Hugh J. Ferry, president of Packard, also: (1) Predicted that Packard's 1949 record production of 104,593 cars would be broken in 1950, with an output approaching 110,000; (2) disclosed that Col. J. G. Vincent, executive vice-president, will head up the new Packard Operating Committee, composed of the company's top brass; (3) told dealers that "Packard is in fine shape. . . . (and) has never been in sounder financial condition."

Ford Motor Company's Flat Rock, Mich., plant will be moved to Monroe as soon as space becomes available in the new facilities. The Monroe plant is still being used partially by Kelsey-Hayes, which sold the plant to Ford last October. The Flat Rock plant manufacturers head lamps, rear lamps, parking lamps.

Production and sale of Ford motor coaches will be discontinued next April. Only 200 Ford coaches were built and sold during 1949. Dropping the coaches from the Ford line will permit greater concentration on car and truck production.

***NASH'S ECONOMY CAR**, a two-passenger sports model, would sell at about $950 with 18 hp engine or $1000 with 36 hp—if it is ever built. That depends on public reaction to the car. Here are some specifications: 4 cylinders; from 45 to 50 mpg with 18 hp engine, 35 to 40 with 36 hp; 47 in. tread; 145 in. overall length; 62 in. height; 50 in. width at seat; 1350 lb weight with 18 hp, 1450 with 36 hp engine. Engine would be made by Fiat or by Standard*

Substitute 1 Machine for 3 or 4!

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BY COMBINING OPERATIONS with

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"DE" (Double End) TRANSFER MACHINE

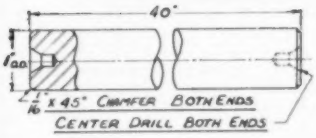
1 SAWS STOCK TO ACCURATE LENGTHS

2 (1) Chamfers both ends. (2) Center drills both ends. (3) Center drills and chamfers both ends. (4) Threads both ends (to a reasonable length). (5) Trepans one or both ends. (6) Turns one or both ends (box tool). (7) Chamfers O.D. and I.D. of tubing. (8) Reams one end or both ends of tubing. (9) Chamfers O.D. and reams both ends of tubing.

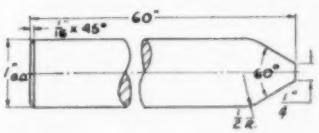
MORE THAN A NEW MACHINE—ACTUALLY A NEW METHOD

The Motch & Merryweather "DE" (double end) Transfer Machine has no equivalent. Standard bar stock is automatically fed and cut off with a square *milled finish* to accurate lengths. It is then automatically transferred to equalizing, self-centering jaws for accurate double-end machining. You save at least one operator; save several handlings; save overhead and floor space; save tooling. Husky construction makes for trouble-free service and long, profitable life.

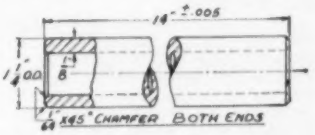
Illustrated below are six typical "transfer" jobs.



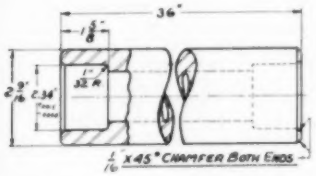
Operation: Cut off, chamfer and center drill both ends.
Material: SAE 1040 ground shafting.
Production: 240 pcs/hr.



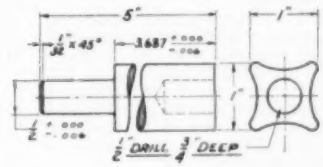
Operation: Cut off, chamfer one end, point opposite end.
Material: D SAE 1141 C. R.
Production: 163 pcs/hr.



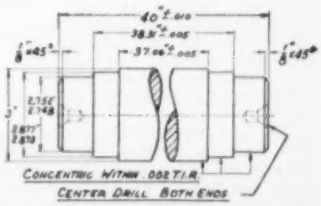
Operation: Cut off and chamfer both ends.
Material: 1020 seamless tubing.
Production: 342 pcs/hr.



Operation: Cut off, bore and chamfer inside and outside, both ends.
Material: SAE 1020 tubing.
Production: 180 pcs/hr.



Operation: Cut off, turn one end, drill opposite end.
Material: Extruded brass.
Production: 200 pcs/hr.



Operation: Cut off, box mill, turn and center drill both ends.
Material: SAE 1020.
Production: 140 pcs/hr.

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Reno to Get Plant for Sub-Machine Guns, Other Arms and Metal Products

RENO—Plans for construction of a large-scale factory in Reno to manufacture sub-machine guns and other arms and ammunition have been announced by Stanley W. Moulding, Washington, D. C., president of the recently incorporated Nevada Arms Industries.

Plans call for construction to start as soon as land can be obtained on the north edge of Reno where the factory site has been selected. The project calls for construction of a 500-unit housing project in addition to the factory itself.

Mr. Moulding reported the concern is a closed corporation with more than $1,000,000 in capital stock, with no stock for sale.

The plant will employ 1200 workers when it gets into full operation and the payroll will be well in excess of $1,000,000 annually.

In Washington, Mr. Moulding heads the International Consulting Engineering & Purchasing Co. He said he chose Nevada as a location for his factory because it is in the center of the distribution area for Army and Navy armaments for the West Coast.

Principal output of the factory will be the Nevada Model 50 sub-machine gun, weighing only 8 lb. Mr. Moulding plans to market the product to all governments who are signatories of the North Atlantic Pact, as well as to authorized civil agencies.

The factory also will produce a complete line of men's and women's sporting guns, later undertaking the manufacture of side arms and other metal products.

The machine gun planned for manufacture was invented by George J. Hyde who designed the M-2 and M-3 rifles and "underground pistols" furnished underground forces in Europe during the war.

Seattle Boeing Fight Irritates Symington

SEATTLE—Irritation of Air Force Secretary W. Stuart Symington over the "Defend Boeing—Save Seattle" campaign here, is clearly revealed in a letter he wrote recently to Senator Warren G. Magnuson of Seattle.

"As you know," Symington said, "most of this agitation resulted from various people in and out of Boeing subsequently protesting against an agreement, made over a year ago, to build the B-47 bomber at Wichita, Kan., leaving for production in Seattle the B-50, C-97 and the new B-52. There never has been any plan to take any additional business out of Seattle, let alone close the Boeing plant in Seattle. In fact, as a result of my recent visit to Seattle, arrangements were made to give additional business to Boeing. Nevertheless, criticism of Air Force policies by various people in your locality has not lessened, rather it would seem to have increased. I do not see how such criticism on the part of these people can help what they say they are for, because naturally the Air Force is becoming increasingly regretful of such continuing unfair attacks which are not based on the truth."

Prototype for the XB-52 is under construction at Boeing's Seattle plant. With Stratocruiser production virtually completed and C-97 orders less than had been expected Boeing's payroll is on the way down, now being about 19,000 level as compared to a peak of 25,000. The downward trend in employment is expected to continue throughout 1950 and into 1951.

8 U. S. Firms to Supply Equipment For France's New Steel Strip Mills

PARIS (McGraw-Hill World News)—Nearly 50 million Marshall Plan dollars are being poured into eastern France's new continuous strip steel mills. This, the biggest ECA project so far, is being undertaken by SOLLAC (Societe Lorraine de Laminage Continu). This merger of nine leading French iron and steel firms, is an entirely private enterprise. But it is financed by French government and ECA funds.

The total investment of $133,060,000 (including 5 billion ECA counterpart francs—$83,700,000) will give France the largest continuous strip mill on the continent of Europe. The remaining $49,360,000 will come from Marshall Plan funds for the purchase of up-to-date equipment from the United States.

Contracting Firms Named

An order for more than 25,000 tons of material went through early last summer. Contracting firms are: Westinghouse, Continental Foundry, United Engineering & Foundry; Wean Engineering, Mesta Machinery, Bliss Manufacturing, International General Electric, and Morgan Engineering.

The hot strip mill, inaugurated Dec. 23, will produce over 700,000 tons of steel coils annually. Output could be stepped up nearer 900,000 tons if the demand exists. The cold-strip mill, also under construction, will yield 250,000 tons of sheets. An additional 350,000 tons of sheets will come from a 48 in. cold mill.

Adding output from the new SOLLAC mills to that of the USINOR plant in northern France (also helped with ECA dollars), it is anticipated the country will be able to export 200,000 tons of thin sheets and 50,000 tons of tin plate, representing 17% of their yearly production of flat steel. Conclusion of the project in 1953 will bring marked progress on flat steel products, light gage plate and tin plate. This is of particular significance for France's growing automobile and canning industries.

In addition to the mills, which should be constructed by the end of 1951, SOLLAC is installing a coking plant of 84 ovens. Capacity is 1600 tons of coal per day; 500,000 tons of crude steel per year—an increase of about 200,000 tons. The new blooming mill under construction will have a yearly capacity of one million tons.

Once the blast furnaces destroyed during the war are rebuilt, production of pig iron is expected to increase to 800,000 tons, as against 670,000 at present. Much of the coal required will come from local mines, rather than abroad as in the past. This will effect valuable savings on foreign exchange.

Further vital economies are foreseen. First, an all-round saving of almost 80% on labor, for which France is hard pushed in the steel industry. Second, 40% economy on fuel, 10% on electric power used in sheet manufacture. Third, for tin plate a saving of 60% on fuel, 35% on electric power.

In the face of growing German competition, increased output and decreased production costs are vital for France to maintain third place among the world's steel producers. For the month of October, production figures of crude steel compared with the principal competitors were as follows:

France	809,000 tons
Sarre	150,000 tons
Total:	959,000 tons
Western Germany	703,000 tons
United Kingdom	1,341,000 tons

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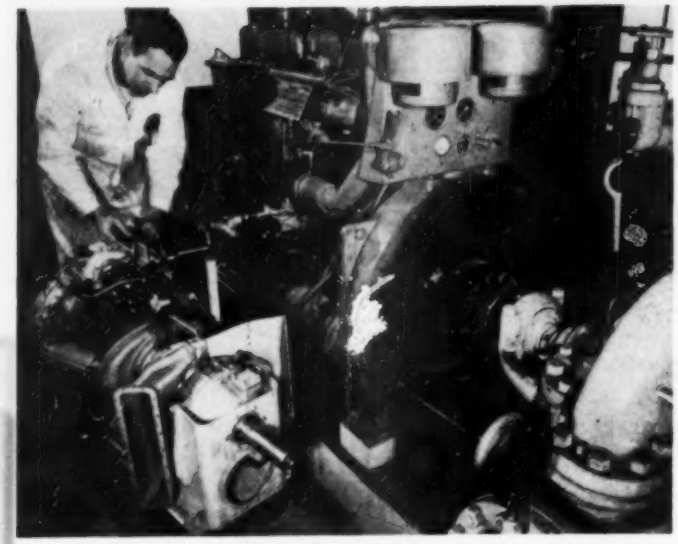


***BOEING GAS TURBINE** (left), which has about same hp as the much larger conventional industrial engine (right) used to drive standby pump, impresses officials to the point where they think this . . .*

New Gas Turbine May End Boeing's Search for a Non-Aircraft Product

SEATTLE—Boeing Airplane Co.'s long hunt for a non-aircraft item to diversify its production may be over. During the war, Boeing investigated the possibility of building everything from washing machines to automobiles in the postwar era, but could find no product it could manufacture at a profit in competition with existing firms in the same fields.

Some Boeing officials think that now, with their new gas turbine, they have a product in a field by itself, beyond serious competition. Edward C. Wells, vice president of engineering, says that the Boeing Model "502" turbine is, "so far as Boeing knows, the most advanced small gas turbine for general application in the United States."

Ready For Industrial Jobs

It's ready right now to prove its adaptability to actual industrial jobs, Mr. Wells says. Boeing expects, during the next two years, to manufacture enough turbines to permit thorough service testing in a variety of industrial and vehicular applications, with large-scale production presumably to follow.

Mr. Wells believes the turbine "may fairly soon be in a position to replace the conventional diesel power plant in the field of truck transportation and that the next ten years may well see the gas turbine beginning to supplant the piston engine in America's pleasure cars." He anticipates that one day the gas turbine will replace the piston engine in most applications from 50 to 500 hp.

Boeing also believes the gas turbine is a "natural" for the field of industrial standby equipment. Weighing only 185 lb, with a continuous output rating of 160 hp and an emergency rating of 200 hp, the turbine can conveniently be tucked away for operation of standby pumps, generators and compressors. It is only 38 in. long as compared to 53.2 in. for a diesel engine of the same hp, 23 in. wide compared to 29 for a diesel, 18½ in. high compared with the diesel height of 45.2 in. Its 1 lb per hp compares to 6 lb per hp in most automotive engines.

Fuel consumption, higher than that of comparable piston engines, particularly at idling speed, is a problem, Boeing engineers admit. Diesel fuel, kerosene and low- or high-octane gasoline obtain about the same results. Boeing engineers expect to perfect the turbine's operation on low-grade industrial fuel oils, including "bunker C."

Critical alloys have been required to withstand the high temperatures required for turbine operation. Cobalt and columbian are among the alloys which, because of their scarcity, Boeing is attempting to replace with other metals.

Reynolds Buys 4 Aluminum Plants

WASHINGTON — Reynolds Aluminum Company has completed a "barter" sale arrangement with the government for four aluminum plants and facilities which were declared surplus following the war.

The $50,018,958 sale includes the Hurricane Creek, Ark. alumina plant and a sinter facility tied in with it; the Jones Mills, Ark. and Troutdale, Ore. aluminum reduction plants, and a sheet and rolling mill at McCook, Ill. Reynolds has been leasing the facilities since 1946.

Terms of the sale provide for a down payment of 5%, and a 4% promissory note for the balance of the purchase price, payable over a 25-year period. The loan is secured by purchase money mortgages. These plants originally cost the government about $130 million.

The "barter" side of the arrangement, contained in the law establishing the General Services Administration (successor to WAA), makes it possible for Reynolds to pay any part of the $3,000,000 annual payment in aluminum, which is transferred from GSA to the military stockpile of strategic materials.

The Munitions Board, upon passage of the GSA law, established a 60,000,000 pound annual quota for "barter" aluminum. The quota is sufficient to cover barter payments by Reynolds and by Permanente Metals Corp, a Kaiser subsidiary. Permanente took immediate advantage of the arrangement this summer to purchase three big aluminum plants.

ASTE Cost-Cutting Show Nears Sell-Out

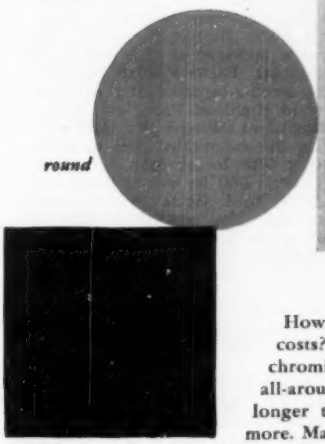
DETROIT—Within sixty days of the announcement of its Industrial Cost Cutting Exposition, some 267 exhibitors had taken 86% of the space made available for exhibits, the American Society of Tool Engineers has revealed.

With applications for space still coming in, the show—to be held in Philadelphia's Convention Hall buildings April 10 to 14—is rapidly approaching the sell-out point, ASTE says.

One reason given by Harry E. Conrad, ASTE executive secretary, in discussing demand for space, was that many manufacturers with postwar sales engineering organizations not yet adequate to meet today's new selling conditions are relying on the exposition to cover their markets with personalized sales efforts.

Ellstrom

chromium plated gage blocks wear 5 to 20 times longer!



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Ellstrom chromium plated gage blocks are available in 12 standard sets . . . rectangular, square, or round . . . in working, inspection, or laboratory accuracies to meet every gage block requirement. Special sets, metric sets, or individual blocks are also available upon request. And every block in every Ellstrom set carries a positive guarantee of specified millionths to give you the accuracy and uniformity you need.

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For longer wearing millionths, specify **"Chromium"** . . . **Ellstrom** chromium plated gage blocks!

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Names in the News

Richard E. Whinrey

William A. Delger

Raymond S. Wood

Richard E. Whinrey has been named assistant general manager at the Ewart (Indianapolis) plant of Link-Belt Co., Chicago, effective May 1. Now assistant general manager at the Dodge plant, Indianapolis, he will be succeeded there by **Raymond S. Wood,** general manager at the Minneapolis plant. **Leslie J. Carson,** formerly chief engineer at San Francisco and at present chief engineer at the Caldwell plant, Chicago, will be general manager of the Minneapolis plant and the north central sales division. **William P. Ridsdale,** chief engineer at Dallas and Houston, has been named chief engineer at Caldwell.

Herbert J. Cooper has been named assistant to the general manager of Cooper Alloy Foundry Co., Hillside, N. J.

John E. Payne has been named manager, central district, Westinghouse Electric Corp., Pittsburgh. He will have complete supervision of the Westinghouse apparatus business in the Pittsburgh, Cleveland, Detroit, and Cincinnati areas.

William A. Delger, plant manager, DeVilbiss Co., Toledo, has been named vice president in charge of manufacturing, and **Don J. Peeps,** chief engineer, was named vice president in charge of engineering. Other changes: **John M. Robinson,** treasurer, was elected vice president and treasurer; **Frank R. Pitt** was named secretary, and **R. Miles Booth,** assistant secretary and assistant treasurer.

Donald H. Waddington has joined the sales staff of the Atlantic office of Bridgeport Brass Co., Bridgeport, Conn. He will cover the states of Alabama and Mississippi.

Dr. Matthew Luckiesh, director of General Electric's lighting research laboratory at Nela Park, Cleveland, for the past quarter century, has retired. Among many lamp and lighting developments conceived and directed by Dr. Luckiesh were: the first accurate glass filters for production of artificial daylight; daylight lamps; flametint lamps; meters for measuring light, ultraviolet, brightness, visibility, and bacteria content of the air.

E. W. Harwell has been elected president, Hamilton Steel Co., succeeding **Harry K. Hamilton,** retired. Mr. Harwell joined Hamilton Steel a year ago as vice president and general manager after a long association with Jones & Laughlin Steel Corp. **Jackson D. Allen, Jr.** has been named general sales manager and **N. E. Willkomm** assistant general sales manager of Hamilton.

M. Herbert Eisenhart has been elected chairman of the board of Bausch & Lomb Optical Co. He has been president since 1935. **Joseph F. Taylor** vice president and treasurer, was elected to succeed Mr. Eisenhart as president.

Douglas G. Eaton has been named manager of the Cleveland branch office of Reed-Prentice Corp., Worcester, Mass.

John P. Roche, vice president of Heppenstall Co., Pittsburgh, was elected president of the Machine Knife Assn. at the group's annual meeting in New York in December.

Alton J. Hole has been named plant manager of the Buffalo pressed steel unit of Ford Motor Co., Dearborn, Mich. He has been serving as general manager of Highland Park operations. **Edgar F. Wait,** who has been serving as assistant plant manager at Highland Park, was named acting plant manager. Mr. Hole started in the automotive field as a die maker with Briggs Mfg. Co. From 1927 until 1931 he was at the Rouge plant of Ford. He left to join Budd Mfg. and later went with General Motors. He was stamping plant superintendent of the Pontiac Div. when he returned to Ford.

Robert B. Colgate has been elected a director of American Car & Foundry Co., New York.

Charles W. Wiegel has been named general manager of Vanadium-Alloys Steel Co. and **Robert E. Shoup** appointed general superintendent of its Colonial Steel Div., Monaca, Pa.

W. H. SaLee has been named general sales manager of Janette Mfg. Co., Chicago, succeeding **Harvey Klunder,** resigned.

W. B. Shirk has been made director of industrial products engineering in the newly-formed product development and production engineering section of Gulf Oil Corp.

B. Russell McBath has been named vice president in charge of manufacturing, United States Hoffman Machinery Corp., New York, after 22 years with Worthington Pump & Machinery Corp. He was general manager at Worthington's Dunellen, N. J., works.

B. Russell McBath

Makers of the NEW UNIVERSAL COFFEEMATIC

POUR THEMSELVES A

YEARLY SAVING of over $10,000.

ON ANNEALING COSTS

To pickle and anneal the body of their new coffee pot was costing Landers, Frary & Clark, makers of the famous line of Universal appliances, $7.50 per M pieces. 5 anneals, which at first seemed necessary to produce the quality product for which Universal is nationally known, jumped the cost per M pieces to $37.50. Universal knew this was far too high and decided to do something about it.

Their metallurgist, in cooperation with Revere, studied the problem in detail and then proved their conclusions by exhaustive tests. It was found that by using Revere copper strip in a certain temper, 4 anneals could be eliminated. Now, after a draw of 7¾", the copper body is annealed once then spun into its finished shape. Based on current production, this has resulted in a saving of over $10,000.00 per year, plus an improved product. Additional savings also are realized through more simplified handling, and more economical finishing operations due to the reduction in the number of anneals.

To make such a deep draw while holding rejects to the absolute minimum would not be possible were it not for the fine quality and consistent uniformity of the gauge and temper of the copper used. The copper body is tin plated inside, while the outside is first nickel plated then chromium plated.

Because of the nature of this appliance, which makes coffee automatically to the individual's taste, then reduces the current to keep coffee at serving temperature, Revere copper was selected for its high thermal-conductivity. This makes it possible to brew the coffee faster and keep it hot longer, thus saving on current.

Perhaps Revere Copper or some other Revere Metal can be of help in developing or improving your product—cutting your production costs. Why not tell Revere about *your* metal problems? Call the Revere Sales Office nearest you today.

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COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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Sales Offices in Principal Cities, Distributors Everywhere.

Walter E. McArthur

Walter E. McArthur has been named manager of industrial sales, Nelson Stud Welding Div. of Morton Gregory Corp., Lorain, Ohio. He was eastern regional manager.

O. V. Badgley, vice president of General Motors and general manager of its Delco-Remy Div. at Anderson, Ind., has retired. He joined the Remy Co. as an assistant foreman in 1909, remaining with the company when it became a subsidiary of General Motors in 1918. He became factory manager of Delco-Remy in 1929 and in 1940 was named general manager. He was elected a vice president of General Motors Jan. 1949.

S. W. Rolph, executive vice president, Electric Storage Battery Co., Philadelphia, has been elected president, succeeding **R. C. Norberg,** elected board chairman.

L. H. Perry has been named to head the hydraulic dept. of Holyoke Machine Co., Holyoke, Mass. He was formerly with James Leffel & Co., Springfield, Ohio, and before that with Charles T. Main, Engineers, of Boston.

F. R. Wilkes and **K. R. Bartholomew** have been named sales engineers for Simonds Abrasive Co., Philadelphia. Mr. Wilkes will serve the Chicago area, Mr. Bartholomew the eastern Pennsylvania and northern New Jersey area.

Frank A. Schotters, recently vice president in charge of operations at Trailmobile Co., Cincinnati, has been named operations manager, Parts Div., Reynolds Metals Co., Louisville, Ky. Before his Trailmobile association, he was vice president in charge of production at Crosley Corp., Cincinnati, and before that was works manager of Western Cartridge Co., East Alton, Ill., and a member of the executive staff of Olin Industries. **Stuart Smith** has been named product manager for sheet and plate sales, with headquarters at Reynolds' general sales offices, Louisville.

Charles R. Cox has resigned as president of Carnegie-Illinois Steel Corp., Pittsburgh, to become president of Kennecott Copper Corp., New York. Succeeding Mr. Cox at Carnegie-Illinois is **Clifford F. Hood,** president of American Steel & Wire Co., Cleveland. **Harvey B. Jordan,** vice president in charge of operations of American Steel & Wire Co., has been elected president to succeed Mr. Hood.

Augustus Vogel, Jr., has been named manager of the File Div., E. C. Atkins & Co., Indianapolis. Before joining Atkins Mr. Vogel represented the Nicholson File Co.

Harry S. Thompson has been named general works manager of American Furnace & Foundry Co. and American Boiler & Foundry Co., Milan, Mich.

Adolph D. Mandl has been named plant manager of Die-Mold Corp., Milwaukee.

James M. Arroyo has been named sales manager, Martin Machine Co., Kewanee, Ill.

J. C. Kemp, general sales engineer of Ampco Metal, Inc., Milwaukee, has been named district manager of Ampco's Chicago office. **R. J. Eckl** succeeds Mr. Kemp as general sales engineer.

Elmer A. Terwell has been named sales engineer in the Chicago territory for Rolock, Inc., Fairfield, Conn.

Business Items

Ready Tool Co., Bridgeport, Conn., has appointed Raymond C. Stoelting, Indianapolis, to handle the Red-E line in Indiana.

Simonds Abrasive Co., Philadelphia, has appointed Van Kleeck-Wilson Inc., Buffalo, distributor in the Buffalo area, effective Jan. 26.

Fellows Gear Shaper Co., Springfield, Vt., has moved its New York office to Room 2206, Empire State Bldg., 350 5th Ave., New York.

Industrial Fasteners Institute, formerly American Institute of Bolt, Nut and Rivet Manufacturers, has moved offices to 3648 Euclid Ave., Cleveland.

Copper Alloy Foundry Co., Hillside, N. J., has named Wm. G. Boales & Associates, Detroit, Michigan representative.

Riverside Metal Co., Riverside, N. J., has appointed International Brass & Copper Co., Inc., exclusive agent for export business.

Nelson Stud Welding Co. of Canada, Ltd., with manufacturing facilities in Toronto, has been established by Nelson Stud Welding Div. of Morton Gregory Corp., Lorain, Ohio, and its recently appointed Canadian distributor, Rudel Machinery Co., Ltd.

Driver-Harris Co., Harrison, N. J., has completed 50 years in business. Started in Newark in 1899, the firm moved to Harrison in 1902 where today it occupies more than four city blocks.

Air Reduction Co., Inc., New York, has simplified its corporate structure in a change involving liquidation of all its wholly owned domestic subsidiaries. Business of the domestic subsidiaries will now be conducted by corresponding divisions of the corporation. Foreign subsidiary companies are not involved.

Hydro-Line Mfg. Co., Rockford, Ill., has appointed two new representatives: Austin-Hastings Co., Inc., Cambridge, Mass., for New England excluding Connecticut, and Hydro Pneumatics, Inc., New York, for the metropolitan New York and northern New Jersey area.

DeLaval Steam Turbine Co., Trenton, N. J., has named Superheater Co., Ltd., Montreal, representative in the Canadian provinces of Newfoundland, New Brunswick, Nova Scotia, Prince Edward and Quebec.

Colonial Broach Co., Detroit, has named F. H. Harris Co., Worcester, Mass., New England service and sales representative, and Dolan Industrial Sales, Houston, to handle distribution and sales engineering in southern Texas.

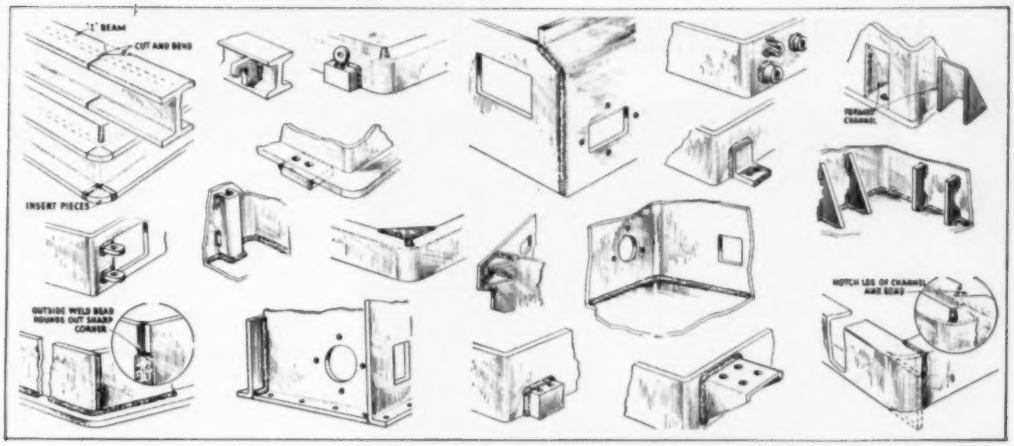
Hauser Machine Tool Corp., Manhasset, Long Island, N. Y., has been named exclusive U.S. factory representative for S. Lambert, S.A. Solothurn (Soleure) Switzerland.

Rotor Tool Co., Cleveland, has named Russell & Olson Co., Detroit, as exclusive agent for the Detroit-Toledo and Michigan areas.

Obituary

Charles Osgood Drayton, 58, vice president in charge of sales of American Screw Co., Providence, R. I., died Dec. 19. Formerly associated with Graton & Knight Co., Worcester, Mass., for 23 years, he joined American Screw Co. 12 years ago as sales manager, being named vice president in 1944. He had served as chairman of the research and cost survey committee of the American Supply & Machinery Manufacturers' Assn.

Ideas on Designing Bases for Greater Rigidity at Less Cost



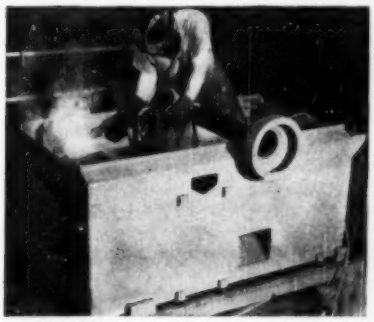
Examples of simple design details for fabricating more durable machinery bases at less cost with arc welding.

Machinery bases built from welded steel possess more than twice the rigidity per pound than cast iron. By fabricating with arc welding, manufacturers are able to incorporate many unique design features at less cost since most component parts are readily cut and formed from standard steel shapes and plate and then clamped in simple fixtures for fast, easy arc welding.

Suggested above are but a few of many design ideas that can be used to simplify the construction of machinery bases, and at the same time, achieve greater rigidity, clean, modern appearance at a remarkably low cost.

In a great many cases, plain structural shapes like steel bars, channels, "I" beams and simple plate are used almost entirely. Where metal forming equipment is available, component parts can be bent to shape, thereby minimizing both fit-up and welding. Many components can also be pre-drilled and tapped on small, high speed equipment, eliminating the need for heavy, slower operating machine tools.

Design improvements or changes to suit customers' needs are more easily accomplished with welded design. Costs and delays of pattern changes are eliminated, thus cutting down overall production time and speeding manufacturing schedules.



Rigid All-Welded Base *for planer. Side members are sheared plate reinforced with stiffeners. Courtesy Porter Machinery Company, Grand Rapids, Mich.*

Clean, Modern Styled Appearance *is made possible with structural shapes and plate. Base has totally enclosed reservoir for coolant storage.*

● More detailed analysis for low-cost design of machinery bases is contained in the "Procedure Handbook of Arc Welding Design and Practice." Price is only $1.50 postpaid in the U.S.A.; $2.00 elsewhere.

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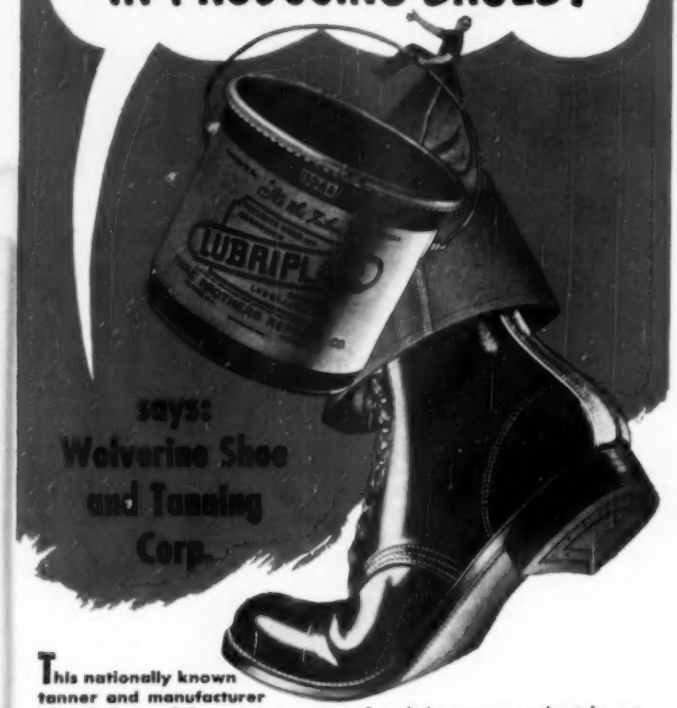

This nationally known tanner and manufacturer of work shoes and gloves writes us . . .

". . . You recommended to us LUBRIPLATE NO. 100 for lubricating the chain drive on our paddle wheels which turn the hides immersed in a solution in concrete vats. The chain, during use, is always soaked. The solution is sometimes acid and sometimes caustic. Up to the time of your recommendation, we had not found any lubricant that would stay on the chains for any appreciable time.

"Heretofore, the average life of a chain was approximately one year. We have applied LUBRIPLATE to these chains every two weeks for two years. Since then, not one new chain has required replacement, and they are still going strong.

"At this time it appears that *for every dollar we have invested in* LUBRIPLATE, *we have saved seven dollars* in chains with actual savings still to come."

WOLVERINE SHOE & TANNING CORP.
Rockford, Michigan

You, too, can enjoy the savings made possible with LUBRIPLATE Lubricants. There is a LUBRIPLATE product for every industry. LUBRIPLATE reduces friction and wear, prevents rust and corrosion and is most economical to use. Write today for case histories of savings made possible by the use of LUBRIPLATE Lubricants in your industry.

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LUBRIPLATE the Modern Lubricant

ROUND TABLE *Discussion*

CAN ENGINEERS COME INTO THE SHOP?

There's no reason why they shouldn't and many good reasons why they should. Ed is undoubtedly right in his claim to be notified concerning alterations to work in progress and most responsible executives of experience will agree that as toolroom foreman it would be wise for the engineer also to consult with him so that possible alterations to design might be achieved with a minimum of machining time.

A talk with the shop foreman might reveal the fact that a proposed alteration to design could not be carried out on the plant to hand without a considerable amount of makeshift and expense. Such a situation would cause the engineer to think again and to probably arrive at an acceptable compromise which would enable cheaper and more rapid execution of the alteration to be carried through on the plant available, without sacrificing any of the benefits promised by the alteration.

This interchange of ideas would not be concerned with "authority" in the sense of giving instructions; rather would it take the form of a discussion as to ways and means. Such procedure rules out the possibility of the engineer instructing the tool foreman's man, a most unwise course to take. Apart altogether from the question of etiquette, it is most desirable that all amendments to existing design be carefully recorded and this less likely to happen if the engineer merely communicates verbally, his wishes in the matter to the toolfitter.

In order that modifications may be correctly carried through, a copy of the drawing concerned should be in the shop and one in the shop foreman's office also. Alterations should be made on each copy, signed and dated and the foreman should also be provided with an "alterations" book which should always lie on his desk. The party making the alteration to the drawings should be responsible also for showing the alteration in the foreman's "alterations" book. In addition, an "alterations" slip should be left on the foreman's desk, intimating the alteration. This slip the foreman should sign and return to the engineer's office. Having been thus notified of an alteration the foreman is expected to refer to his "alterations" book in order to

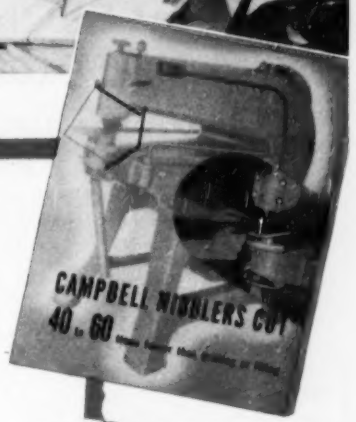
maybe we could *nibble it!*

. . . and very often that's the *best solution*

If it's a problem of cutting irregular shapes out of sheet metal — in quantities that don't justify making a special die — a CAMPBELL NIBBLING MACHINE very likely will give you the solution

Campbell Nibblers are making themselves indispensable in tool rooms, machine shops, experimental departments, sheet metal departments, even production lines. From a wide range of models you can select the one that will serve you best.

Let us send you a copy of our newest booklet about Nibblers. Just write for DH-593.



THIS BOOKLET gives you detailed information about Campbell Nibbling Machines —their possibilities and limitations. *SEND FOR YOUR COPY. IT IS DH-593.*

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Duplicate time tickets and other forms provide data for complete control at one-writing. Repeated postings of the same information have been eliminated. One copy is quickly filed on Planning Boards above, providing a visible record of progress and work-in-process by operations.

The other copy furnishes identical data for cost records. Both are immediately available at the end of operations or shifts.

McCaskey Tool Control has cut the loss of tools, time, tool breakage, and excessive inventories. McCaskey systems have brought numerous real savings.

Write for a demonstration or for descriptive folders. No obligation, of course.

THE McCASKEY REGISTER CO.
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keep abreast of last-minute modifications.

If previous consultation has taken place between the engineer and the shop foreman as suggested earlier, the "notice of alteration" will not merely confirm modifications already agreed on but will put the matter on record and give the shop foreman his place as a responsible executive.

C. D. Mackinnon
Airdrie, Scotland

•

THE ITCH TO TRAVEL

No ONE SHOP can teach a man everything in the mechanical line which he might well know; and knowing, he should be a better man in his trade.

At some time in their lives, 75% of the men in all trades have the cerebral itch to get out and see some of the world and the things in it.

In the United States, there are more than 22,000 trades and vocations. Men whose training and experience have been extensive and in more than one part of the world are better prepared to do good work and more of it than the men who have followed one line, in one shop, and in the same surroundings year after year.

The time is not past when many good men like to get out and see what and how the other firm and other men do in these times and in the same line of occupation.

In many instances, men have bettered their conditions of work by traveling and stopping at some distant place while others have returned home and have been better equipped mentally.

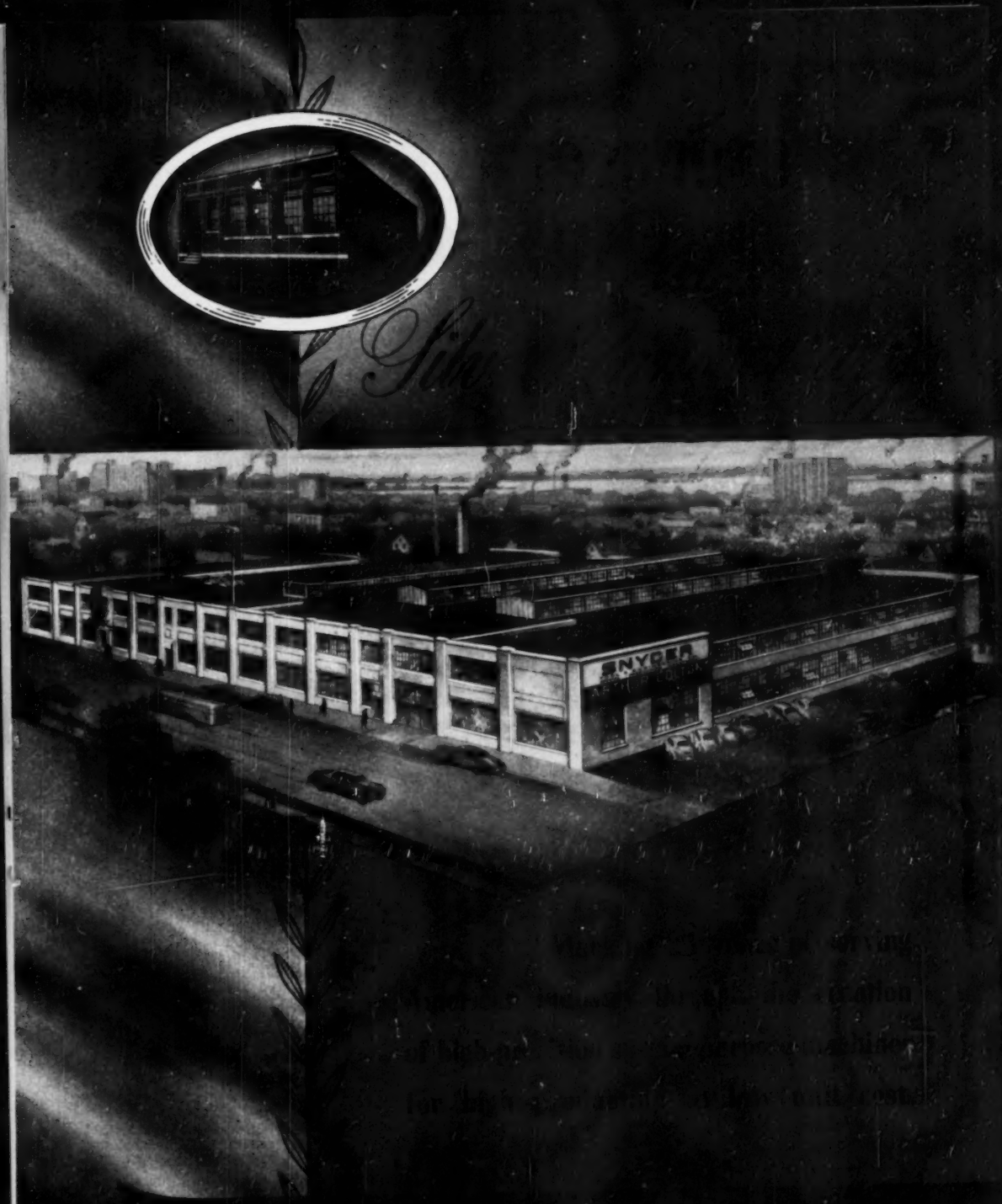
Let us come down to cases and look into a couple of examples of men of wide experience.

The writer several times has had business with the railroads. During one extensive trip, the acquaintance of a tramp draftsman was formed who had been twice around the world.

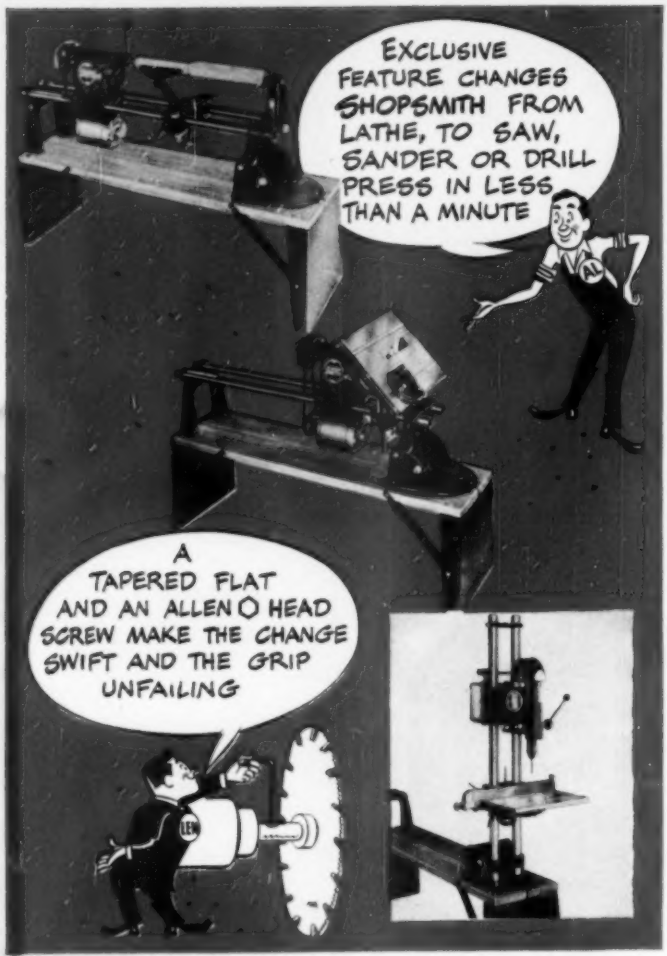
In the exchange of a later conversation, he learned where I was to visit and also learned that there was a possibility of an opportunity with the railroad in the drafting room. He requested the influence, if any, which I could render.

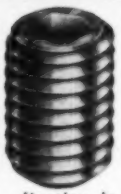
The railroad offices were entered; my introduction to the division superintendent proved to be very agreeable, and after some pleasant exchanges of remarks, an inquiry was made in re an opportunity for my acquaintance in the drafting department and reference was made to the chief draftsman.

The time was about 10:30 in the



SNYDER TOOL & ENGINEERING COMPANY
3400 E. LAFAYETTE, DETROIT 7, MICH.


EXCLUSIVE FEATURE CHANGES SHOPSMITH FROM LATHE, TO SAW, SANDER OR DRILL PRESS IN LESS THAN A MINUTE
A TAPERED FLAT AND AN ALLEN O HEAD SCREW MAKE THE CHANGE SWIFT AND THE GRIP UNFAILING



Magna Engineering Corporation of San Francisco standardizes on Allen O Head screws and is using more than a million a year for SHOPSMITHS and SHOPSMITH attachments. A particularly important application is the use of Allen O Head Set Screws to fasten the various attachments to the spindle tip. With more than 30,000 SHOPSMITHS sold the manufacturer has yet to receive one single complaint of an attachment accidentally coming off the spindle.

Where there's an application for a precision fastening the safest, most economical answer is the use of an Allen O Head screw. This is particularly true when the screw must retain its smooth threading and holding power after long repeated wrenching. *Sold only thru leading distributors.* Write the factory direct for technical information.

WARNING
Allen-Type screws aren't necessarily Allen-Made.
Get genuine "Pressur-Formed" Allen O Head screws in this black and silver box.

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ALLEN HEAD

FOR 40 YEARS THE BUY-WORD FOR SOCKET SCREWS

morning when I approached this man and asked about an opening. The chief draftsman asked one question and made one very short statement.

To quote the man, "What is his experience?"

My reply was, "He is in off the road."

"Tell him to come to work at 1 PM."

This man, who had charge of this large drafting room, knew from experience that there was no class of draftsmen the equal of the itinerants. Some time afterward, this same draftsman said that the man in question could wear out more pencils and sling more ink on drawings than any man he had ever hired.

A variety of experience had made this man valuable to any employer who might engage him to work.

Let us look into a second case:

A crew of seven men and a leader, all employed in a jobbing shop, was sent to a large manufacturing plant to erect a lot of structural work, install about 25 machines, repair a four-ton locomotive which laid on its side in one of the shop buildings, also other work. They began work on a cold, bitter February day.

After getting squared around, the leader happened to pass through the engine room and there stood a typical derelict of humanity whom the engineer had allowed to come in and stand by the engine so he could get warm, for he had been nearly frozen. A few questions were asked by the leader of the engineer about this apparent wreck, and the replies showed that he was a machinist.

Now, neither the leader nor any of his men had ever worked in a railroad shop and the repairs necessary to be made on the locomotive were rather out of their lines. The tramp was approached.

Had he ever done repair work on a locomotive? He had, so after about five minutes of discussion, he was taken to the part of the plant where the engine lay on its side. He was asked if he could put it up on its wheels, repair it and put it in running order. He could. He was hired on the spot.

First, by an ingenious method, he, alone, righted the engine, then he went about the task of taking it apart. He made no false moves so both the operation of getting it upright and dismantling it interested every man who worked in his vicinity.

He reported that the engine needed one new piston; both cylinders required reboring; the slide valves should be refaced; the petticoat pipe was practically gone; it would be

THE "LEADER" ON *Finishing* TAPS

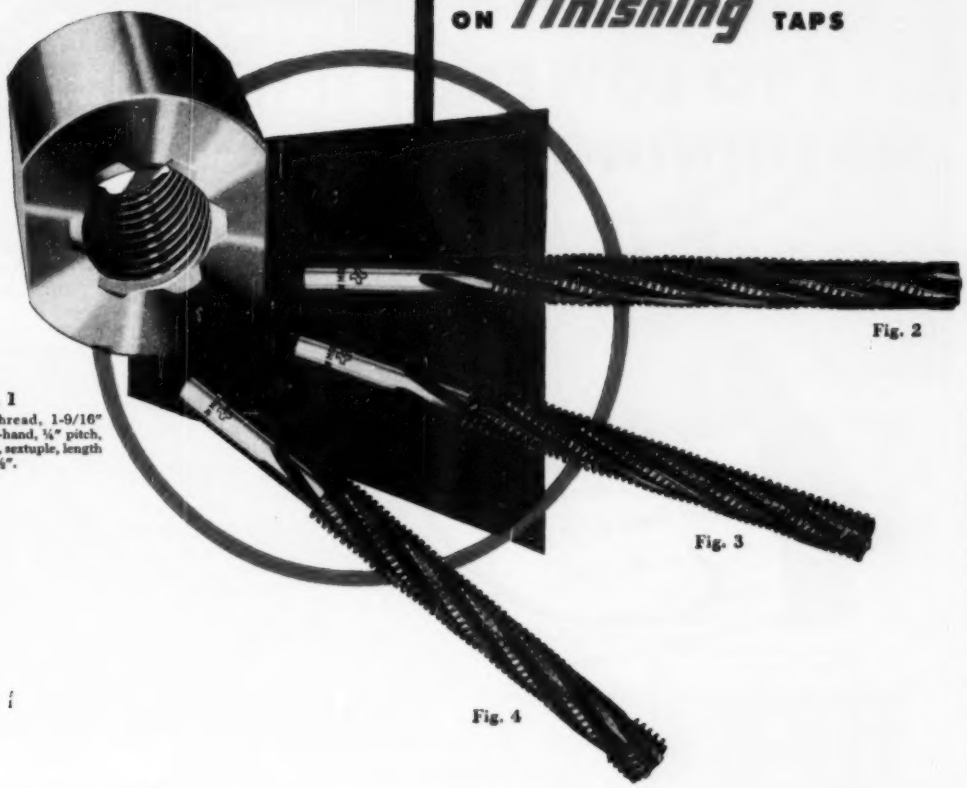

Fig. 1
Acme thread, 1-9/16" dia., left-hand, ¼" pitch, 1½" lead, sextuple, length of nut 3½".

Fig. 2

Fig. 3

Fig. 4

NO... this is not a self-applied pat on our own backs. Here's the story... and the pictures.

FIG. 1... shows a difficult tapping operation successfully performed with a set of 3 H-W "Finished Taps"... (finished after hardening).

FIG'S. 2-3-4... show the two reasons for the successful job... one, the spiral flutes at right angle to the thread, which give correct cutting action to both sides of the teeth... two, the "Leader" sections on taps (Fig's. 3-4), which correctly engage the thread cut by the first tap (Fig. 2), and follow exactly the same accurate path. This thread had to be chased until Hanson Process taps were used. The economy of "Finished Taps" is therefore evident... as are the design and accuracy of H-W taps.

HANSON-WHITNEY MACHINE CO., HARTFORD 2, CONN.
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Valuable engineering, illustrated catalog on request. Please use your business stationery.

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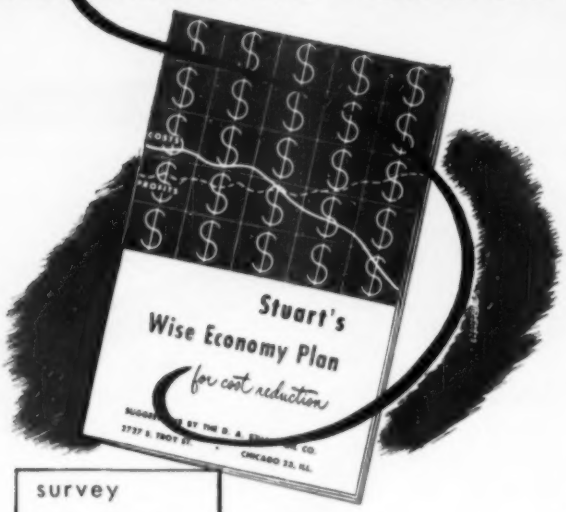
THW50

HERE IS THE WAY TO LOWER MACHINING COSTS



NOT just another spot check "oil survey", the Stuart plan is a scientific appraisal of a plant's over-all cutting fluid needs. Ask for details.

D. A. Stuart Oil Co.
EST. 1865 LIMITED

2729 S. Troy St., Chicago 23, Illinois

necessary to replace nine boiler tubes, and other items of repair were badly needed. To all appearances, he knew his stuff.

The leader of the visiting crew approached the manager of the plant who, without question, gave him the green light to go ahead. At the same time, he ordered his purchasing department to buy the necessary materials for the repairs to the locomotive.

The work done by the tramp was so interesting to those who worked near him that their foreman sharply called their attention to the fact that they were letting down on their machine work and production was suffering.

The hobo, with no assistance, rigged a cylinder-boring tool, made several gages, and these were as good as could be made and he accomplished much during a working day, for he was an expert. He was well liked by others who became acquainted with him during his stay in the shop.

He finished the repairs on the engine and all were done in a splendid and workmanlike manner, then did work in the home shop.

By the time three months had elapsed the weather was balmy and he needed a drink. He quit in the face of a good offer of an increase in his pay envelope. No dice, as far as he was concerned.

Nobody in the plant or the home shop ever heard of or saw him again. He was one of the "ships that pass in the night."

These "traveling men" learn their stuff by rubbing elbows with those men who know more than they do, and by such acts they are in positions to evolve new and original ideas.

While it is well to remember that a rolling stone gathers no moss, it gets a mighty good polish.

Among the callings, where men of varied experience shine, are draftsmen, machinists, molders, printers and itinerant farm laborers. The belief is that many of them are misjudged for there are many who are honest, square dealing individuals and they deserve a lot of real consideration. Lots of them are the best workmen in their lines, so we believe that Al is all wet on the subject.

F. H. Stebbins
Worcester, N.Y.

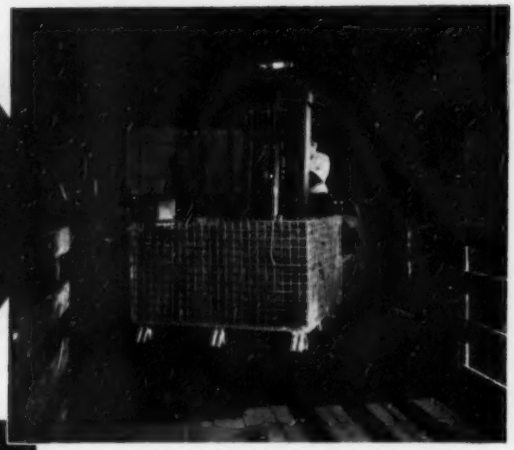
•

According to my way of thinking, there are three kinds of people—the stayput, the handicapped and the restless soul.

The stayput is a man that will start working with his father or brother

Pittsburgh CARGOTAINERS

Speed Operations and Reduce Handling Costs



Above, CARGOTAINER being loaded into delivery truck at vendors holds 345 castings—more than 2700 lbs. Previously only 88 castings weighing 704 lbs. were handled in odd size drums by one man in the same amount of time. Uniform size of CARGOTAINERS allows easy stacking after castings are loaded—also affords more efficient handling from inspection through shipping.

CARGOTAINERS in above photograph are received at assembly plant from vendor—are easily unloaded directly from truck to storage space. Note ease of stacking and minimum of storage space required, also the variety of parts that pack easily in CARGOTAINERS.

At right, CARGOTAINERS again save additional handling time and costs at end of machining process on castings. Parts are easily packed back into CARGOTAINERS and moved to storage to await final assembly. The awkward gap between vendor and assembly plant is easily bridged with versatile, maneuverable CARGOTAINERS.

For further information on Pittsburgh CARGOTAINERS, write Pittsburgh Steel Products Company, Department AM, Grant Building, Pittsburgh 30, Pa.

CARGOTAINERS by Pittsburgh Steel Products Company
Subsidiary of
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"JUST WHAT I'VE BEEN WAITING FOR!"
the NEW SIBLEY MODEL E-25
DRILLING MACHINE
It's not too light! — not too heavy!
Fills long awaited need for medium weight Drill Press
Sensitive drilling machine with 25" swing for high speed production, yet suitable for maintenance work. Variable speed drive—select exact speed for any size drill from 1/8" to 1"—self-locking, convenient speed control—no belts to change—tachometer provides accurate reading of spindle speeds. Powered with 1½ H.P. motor. Five spindle speed options, each with a 4 to 1 range from a low of 206–825 R.P.M., to a high of 540–2160 R.P.M., with 3 phase 60 cycle motor. Oil groove table accuracy maintained to .0007" in 6 inches—maximum spindle travel 8". Splined spindle and driving sleeve are ball bearing equipped for free floating action. Alloy steel spindle and quill precision machined and ground. Column diameter 4½". Machine weight 765 lbs. Chart shows proper speeds for different drill sizes.
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or will take the first job obtainable before finishing school and will remain on the job as long as he can or until he is discharged—not for not doing his job, no, because he will do his job as good as he can; will be a good timekeeper, no trouble to his boss or foremen, with the exception that if you give him another job you will have to show him what you want him to do.

It will take you a little more time to break him in on a new job than other men, but when you do your troubles are over. He will do as you show him. You can teach him without supervision and for years on the same job he will do it without clock watching from whistle to whistle without complaints or trouble. He will offer no suggestions for betterment and will not listen to a co-worker if he will suggest how to do it better. The foreman and boss is his only man to listen to. He has no desire to change; what for?

The handicapped one is not a man that has lost a hand or foot or hearing. He is only handicapped because he must stay on the job because he must earn his pay to help his mother, sister, brother or has a family to support and wife and kids. He can't change jobs unless one is offered with better pay and there will not be any loss of pay. Then he will consider will it be a steady job, is there more security in the new job, are there advantages such as insurance pension? Then he might make the change. He will be a good worker, a good timekeeper. Some of them will be of the brooding type, will show to the other men in the shop that they know better than the foremen, will rebel. Not openly because they will be afraid of reprimand that may cost them loss of pay. Some will be time clock watchers. Now mind you, I say "some of them," as you will find in any group of men. But those some will be of the more troublesome than otherwise, because they will feel as if they are kept there on the job against their wish, because they are handicapped with their financial responsibilities and would like to move or go to other places to see what others are doing, how people in other shops are working. But they can't do it, their economic conditions will not allow it.

The restless soul is a man that is free as the wind in the fields. He has no one but himself. It does not have to be that he is single, not married or have no family. No, he is an individual that considers only himself and his own whims. He will make a very good conscientious worker if he likes his job. He will try to do his job better than the

Super-smooth
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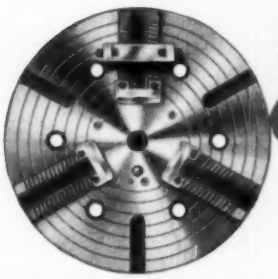
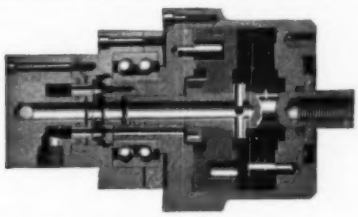
OF CHUCKS AND AIR
CYLINDERS *with*.....

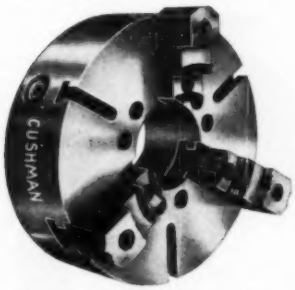
CUSHMAN *Static* BALANCING



CUSHMAN "ACCRALOCK"* POWER CHUCK



CUSHMAN ROTATING AIR CYLINDER



CUSHMAN WRENCH OPERATED CHUCK

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Today, with the increasingly high speeds at which precision machine tools are operating, it is essential that vibration and chatter be eliminated from work holding and control equipment.

With Cushman Power and Wrench Operated Chucks... and with Rotating Air Cylinders, you are assured of a new degree of smoothness in operation. This is due to our accurate Balancing Checks throughout manufacture and after assembly of chuck bodies and cylinders. No product is shipped without a final static balance test... using the Gisholt Static Balancing Machine illustrated above. We believe this feature to be of great value to buyers of Cushman equipment to be used either for manual or power chucking.

Bulletins covering Cushman "Accralock"* Power Chucks, Wrench Operated Chucks, Power Wrenches and Rotating Air Cylinders, on request.

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Save dollars, save time, with the **OLIVER DRILL POINTERS.** Twist drills sharpened on the Oliver No. 510 Drill Pointer are more ***uniform,*** have ***longer*** drill life, because the Oliver Drill Pointer produces a theoretically **PERFECT POINT** that is always constant.

Inspection of a drill pointed on an **OLIVER DRILL POINTER** will show a gradually increasing clearance toward the center of the drill, with less chisel point angle. This reduces ***thrust*** and ***increases*** the operating life of the drill.

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No. 510 for drills ¼" to 3"—2-3-4 flute. Variable clearances. Variable point angles. Full automatic operation.

No. 21 Oliver Bench Drill Grinder. Hand operated for drills No. 57 to ½". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

Write for literature that will save you dollars in your tool room.

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rest. He is an artist or a primadonna in his kind of work. He will work for a long time on a job as long as it interests him and as soon as he loses interest he will move on to newer fields to tackle new problems in his profession or field of work. After a while he might come back. When he does he will be as good a worker as always.

I don't know if Al has in mind the restless soul or just a man that leaves his job because he had to leave. I know of some men that were gambling and borrowed money off everyone that would lend them some. Then they had to leave. Now if Al has men like that in mind or some similar cases I don't blame him. Men like that were no good and will be no good at any time.

I am of the opinion that Ed is a good judge of men when he points out old Jeffers and Potter.

Michael Axler
New York, N. Y.

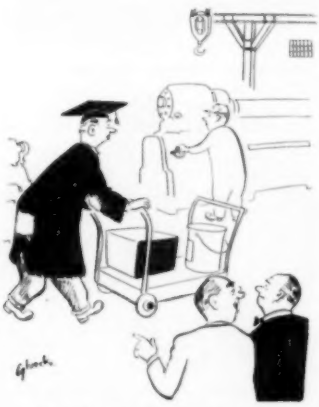
•

PAYING OR PAID GUESTS?

General conditions and shop circumstances are the governing factors as to whether or not it is feasible to hire students for the vacation period. If business conditions are such that the placing of a student on the payroll does not rob a needy person in the surrounding community of a job, then there is nothing wrong with the idea.

The nature of the job vacancies is another factor to be contended with. From a standpoint of sound management it certainly does not pay to place a student on a skilled or semi-skilled machine job requiring a training period of a month or two.

On the whole, and this is taken from personal experiences with stu-



"God, haven't seen that since '32!"

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LAMINUM* Shims give .002 inch accuracy

WITH AS MUCH AS

.063 inch tolerance

PRECISION ADJUSTMENTS by simply peeling .002 or .003 inch laminations. *LAMINUM* shims available in thicknesses from .006 to .126 inch.

FOR SPLIT BEARING of lathe headstock spindle. Even after peeling, shim is always uniform in gauge, with a hard, clean and smooth surface.

FOR THRUST BEARING adjustment of pump. Peelable shim is valuable for takeup of wear after service, reducing "down time" for maintenance.

...cutting lathe costs ...saving assembly time

Use laminated shims, stamped from *LAMINUM*, to position machine elements accurately. With a .126 inch shim, made up of .002 inch laminations, for example, you have a full ⅛th inch of adjustment **built into** your assembly. There is NO filing or precision machining or grinding.

PLUS these advantages:

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Press capacity to 100 tons, 24 inches square, shallow draw. Special equipment and variety of dies can eliminate die-making for short runs. Wide stock of materials. Let us quote on your *difficult* jobs.

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dents working in the shop during the summer, I have found that if placed on routine or unskilled jobs they have proved to be excellent workers. It appeared to me that most of them wanted work of this nature. Perhaps it was a form of diversion, a chance to get away from a continued period of study.

Some of the engineering students fitted in very well in the drafting room, particularly on detail drawing assignments. While placements of this nature were useful to management, they also afforded the students the opportunity to grasp some of the practical aspects of modern engineering practices.

Peter L. Budmitz
New Britain, Conn.

•

All things being equal, no far-sighted foreman will by-pass the opportunity of offering summer jobs to engineering college students. Where working conditions and schedules permit, and suitable candidates are available, a shop will find it a worthwhile and not a philanthropic venture to afford summer employment to embryo engineers. This is a two-way arrangement that will benefit both parties to the set-up. The shop will benefit from the engineering viewpoint on shop practices made available. The students will benefit from the valuable shop experience to be gained.

Of course, the kid engineers who are still going to college are of little use in a shop at the start. Their advantage, however, lies in the fact that they are usually good at mathematics and mechanical drawing and can quickly pick up a modicum of shop practice that will soon make them valuable in the shop.

Another point to remember is that these summer job-holders will prove good advertisements for the shop that employed them.

Most foremen know that there is no better way to learn things than to get the other fellow's point of view. An engineering student should have an interesting point of view toward local shop practices; a point of view that should prove of interest to a progressive foreman.

Offering summer jobs to college students is a form of cooperation that will pay off in getting better graduates from the local engineering school who will carry with them the knowledge that the company was a good employer and represented a good place to work.

The shop of today offers a fitting textbook for the engineering student of today who is preparing for the industrial problems of tomorrow. It is true that the engineer does not

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- Delcote Coil Insulation
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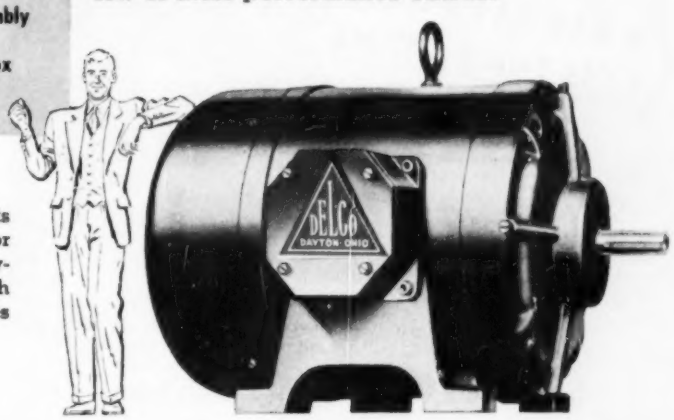
Production Men Have Found the Answer to Better Motor Performance

There's no magic to it—just a motor that's built the way production men *want* their motors built. And more and more spec sheets carry the message "DELCO PREFERRED" to take advantage of the extra care and extra features that make Delco motors outperform all others. Here are a few of these *performance extras:*



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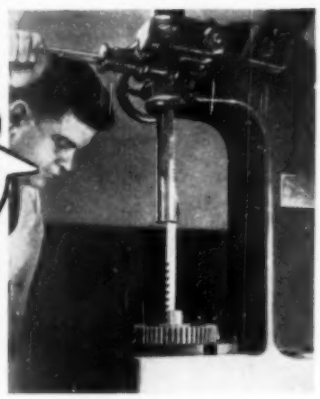

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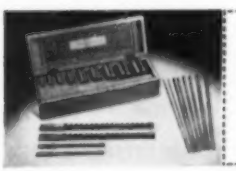

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reach a state of maturity, where fundamental thoughts and practices are crystallized and standardized to a considerable degree, until he graduates and has had practical engineering experience. In the shop the embryo engineer will obtain the opportunity as a student to see the practical application of basic principles of engineering as applied to shop work. This preparation will prove valuable, if he is an intelligent and discerning individual, in furthering his basic engineering knowledge, and building up an adequate background through contact with men, materials and machines.

The idea of service to the community is brought to the foreground by such action as offering summer jobs to students. It is a worthwhile and commendable action and reflects beneficially and in a positive manner on the company's public relations.

Employment in the shop will give the student an unexcelled opportunity to see in actual practice some of the theories he has been taught. In the shop he will find a definite endeavor to clothe the abstract principles with both facts and explanation sufficient to show clearly how the principles apply and to bring the student into close contact with actual operating detail.

Use of temporary engineering college help will yield valuable experience to the shop and the fruits of this experience may be manifested in beneficial improvements for the enlightened company which follows this practice. It has been proven that sometimes "You can't see the trees because of the forest." A fresh viewpoint, even though temporary, may focus desirable attention on some shop practice, procedure or machine operation, and lead to its ultimate betterment. Furthermore, the enthusiasm of the youthful students in the shop may prove contagious in stimulating an atmosphere conducive to greater productivity.

Progressive companies know that there exist limitless opportunities in every industry. Where there is an open mind, there will always be a frontier. The engineering student stands at that frontier ready to offer opportunities to the open-minded foreman who will give him the chance for temporary employment during the summer months.

Harry Kaufman
Philadelphia

•

Speaking from personal experience, I find that I agree with Al 100%. The type of eduction that an embryo engineer gets during his summer months most definitely is of vital

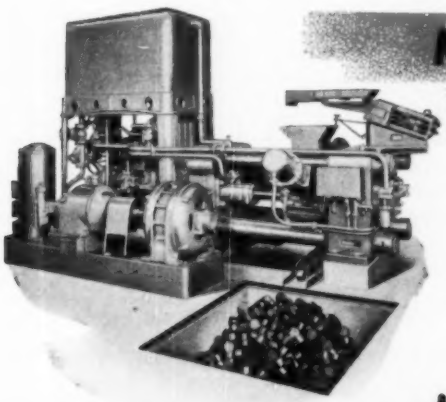
CASH IN YOUR Chips!

Comparison of borings and turnings, before crushing, after briquetting.

Why Hang on to Bulky Scrap When You Can Turn It into CASH — Quickly and Easily!

Yes sir! It's like trading white chips for blue ones. With a Milwaukee Briquetting Press, you can easily convert your bulky borings and turnings into more profitable, compact briquettes. You not only conserve valuable floor space, but the briquettes give you a clean, machineable metal, made of your own scrap, and of known analysis. Briquetting means EXTRA PROFITS . . . the result of more efficient scrap handling.

Investigate the value of your chips! A Milwaukee Foundry Equipment Engineer will gladly help you. Write — today.



Milwaukee Hydraulic BRIQUETTING PRESS

Model No. 350, shown here, compresses bulky scrap into compact briquettes (from 4¼" to 5" in diameter) at the rate of 720 briquettes per hour. Steel, cast iron or non-ferrous metal. Briquettes are uniform in size and density. Press is fully automatic. The entire briquetting plant, including, hoppers, conveyors, elevators, crushers, etc., can be completely amortized in 7 months to 18 months, depending on type and volume of borings or turnings used.

● **Look to MILWAUKEE when in need of Molding Machines, Core Blowers, Core Grinders or Briquetting Presses. Write for descriptive literature.**

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Division of SPO Inc.

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TRAILER HITCH MANUFACTURER
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AS A UNITCASTING
- Cost Substantially Less!
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This product was really planned from all angles! After the mechanical success of the pilot model, using a weldment, the manufacturer figured production costs, sales appeal and qualifications such as durability. Although the weldment served its purpose for experiments, *it didn't answer any of the marketing problems!*

Unitcast engineers solved the difficulties. Toward a quality product, *Unitcastings* contributed a low *finished* cost; the trailer hitch had eye appeal; and all parts were accurate and durable. The job had been made right with steel castings . . *foundry engineered to fit the job!*

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Corporation
QUALITY STEEL CASTINGS

Unitcast will welcome the opportunity to provide a "cast steel" answer for your parts problems, too. Our suggestions toward design, *while your product is still on paper*, may save you many dollars in time and future revisions! Write or call today! Unitcast Corporation, Steel Casting Division, Toledo 9, Ohio. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

UNITCASTINGS ARE FOUNDRY ENGINEERED

benefit to him and to his employer for the following reasons:

1. I obtained at first hand a training that has benefited me if for no other reason than that I learned to know and handle tools and equipment. In so doing, I picked up a knowledge of their use and value. In addition, by being in a shop I learned shop talk enabling me to talk to shop men in their own language.

2. The personal contacts I made helped me in my dealings with people. It enabled me to realize that these people are not merely "shop workers" but human beings. This early understanding of people has aided me to handle and deal effectively and fairly with my associates.

3. In a certain sense, I got the feel of a manufacturing plant—type of work done and how it is done. I also got an insight into the orderly arrangement of machinery and processes and why things work out as they do.

4. I also learned what work is. I lost any thought of stepping into a nice cushioned job just because I was a college man and all I had to do from date of graduation was to direct things. Summer work does more to knock this thought out of a young man's head than all the talk in the world. In other words, I lost my swell head at an early age.

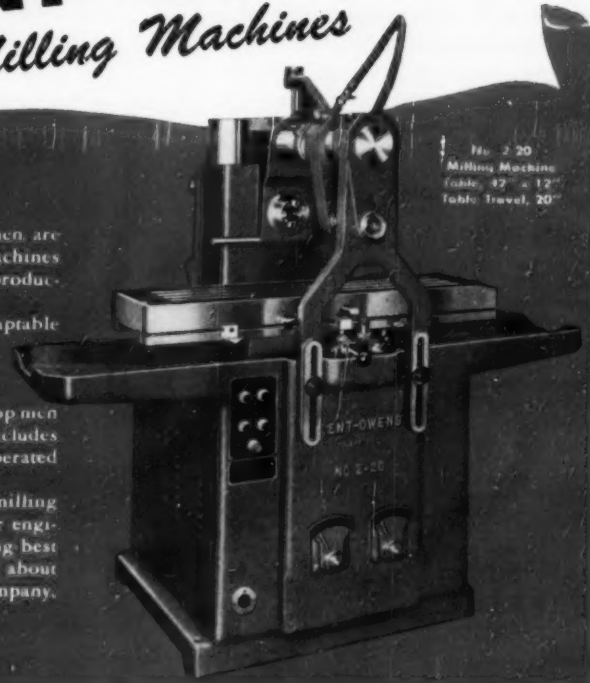
5. It helped me to determine whether or not I was adapted for shop work, whether or not I could develop myself to do this kind of work, and of extreme importance, the company employing me was able to determine whether or not I was a good prospect for them to hold on to and develop or surrender me to some other activity.

Now insofar as my value to the company then was concerned I must admit that it wasn't much, but it must also be realized that any young man just starting out with any company is of no great immediate value either. However, a company, through previous association with a young prospect such as I, can evaluate his possibilities and determine his fitness for a job with that particular concern. If he measures up to the requirements set forth and he likes the type of work that he may be asked to do or indicates a desire to continue with the company after graduation, everyone concerned has benefited. The young man is further along the road of advancement and the company has gotten a man having a knowledge of the company and its product and consequently can realize on its previous investment in him sooner than it might have had he started fresh out of school.

Financially both benefit—this is

"KO" D. HIGH COSTS IN MILLING

with KENT-OWENS *Milling Machines*



Today more than ever—production men are depending on Kent-Owens Milling Machines for the *speed* and *accuracy* that keeps production UP and costs down!

These machines are versatile—adaptable to countless milling jobs. They're outstandingly rugged . . efficient . . dependable. Designed for easy handling with practical features that shop men like. The Kent-Owens Standard line includes a wide range of hydraulic and hand operated machines.

If you're "floored" by a tough milling problem—call on Kent-Owens! Let our engineers recommend machines and tooling best suited to your requirements. Write us about your needs. Kent-Owens Machine Company, Toledo, Ohio.

Rolling Worm Threads

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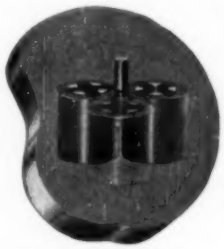
CYLINDRICAL DIE THREAD ROLLERS

Reed Thread Rollers, with three cylindrical dies, produce uniform, accurate worm threads, with burnished micro-finish, at rates up to 1,000 per hour. Quieter worm drives with longer life are obtained and heat-treating of worms is, in many instances, eliminated.

A Complete Thread Rolling Service

Devoted exclusively to the design and manufacture of Thread and Form Rolling machinery and tools, Reed pioneering experience and skill is available to help do the complete job, from engineering application to final production. Technical data on bolt and screw thread standards and thread rolling practice, as compiled by our engineers, is available to interested customers.

Send us specifications of your requirements and let us supply you with complete information.



The heart of the REED Thread Roller—cam-actuated triple dies that permit the thread to be formed at any desired constant, or varying, rate of penetration.

REED ROLLED THREAD DIE CO.

Manufacturers of

THREAD ROLLING MACHINES AND DIES • KNURLS • THREAD ROLLS

Worcester 2, Massachusetts, U.S.A.

AM-1113

important too! Very frequently any youngster can start his job after graduation at a higher level of pay because of his previous experience while the company is able to rely upon him to a greater extent than if he were just starting in with his training. The company also benefits because it can give real and more difficult assignments to him than it can to a starting trainee. I know, it happened to me!

By all means let's have these young men work in industry during the summer. Their early development can only help to promote and sustain American industry in its position of world leadership which it holds today.

Robert F. Schwarzwalder
Wood Ridge, N. J.

•

I wonder if Ed is the kind of man who suggests that you invite him out for a long motor tour and then kicks if you suggest that he pick up the luncheon check.

If a shop takes on one or two likely young men for the summer it is a good investment. The foreman might have to spend more time with them than with an old timer but they can be put on some of the minor repetitive jobs that can be learned in a few hours and nobody else wants.

True, just about the time they learn their way around they have to go back to school but the next summer (if Ed treats them white) they will be back and ready for a more important job.

Too they bring in ideas which may be of service and profit to the shop even if it does jar Ed clear down to his boots to find that somebody else does have ideas besides himself.

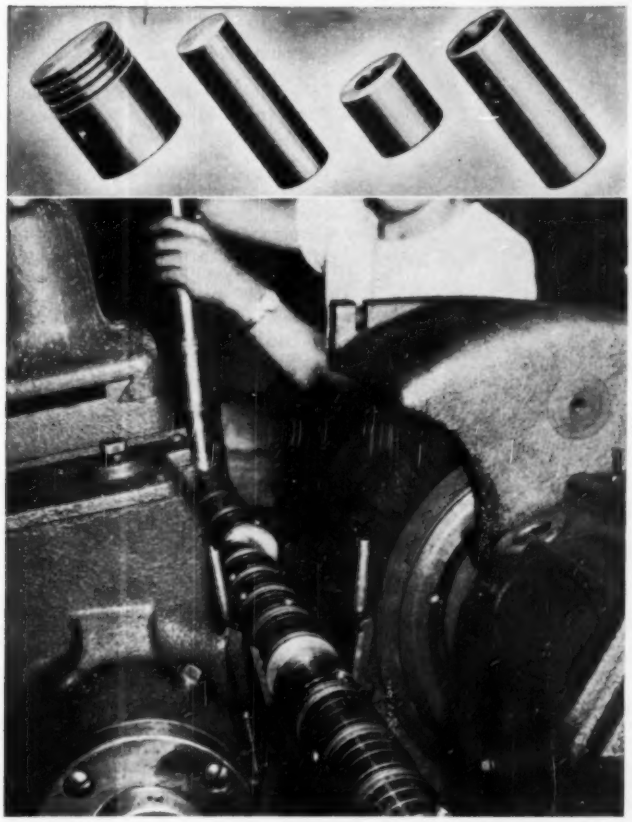
Some of those young fellows DO have ideas and that is just what Ed is worried about. Ed wants to get some youngsters that don't care for an education and make them copies of himself doing things in a manner that all other shops threw out before the war. Or if he gets an older man he is unwilling to admit that some other shop may have trained him as a boy.

It does not cost any more to take on a college boy for the summer than to take on an uneducated boy that you expect to keep and then have him quit in a few weeks. (Or possibly you have to fire him.)

Ed expects the colleges to turn out finished men that can come into his shop without an introduction or breaking in period and fit in. He does not realize that his shop is different from any other shop and that a new man takes time to get oriented. Also if he takes on a college boy he is

ANOTHER NEW OSBORN DEVELOPMENT FOR CUTTING COSTS

"CENTERLESS BRUSHING"



HERE, Osborn "centerless brushing" finishes cast iron pistons to micro-smoothness, greatly simplifying assembly operations and increasing life of pistons and cylinders. Output of this one machine is 10,000 pieces per 8 hours. Rejects in assembly operations have been practically eliminated. The 20" O. D., 6" face Osborn Master® Rotary Brush has .005" crimped wire . . . rotates at 1200 RPM.

For mass-production finishing of cylindrical parts such as pistons, pins, bushings and tubing.

TO speed up assembly operations involving cylindrical parts such as pistons, pins, bushings and tubing, and to improve their performance and prolong their life, Osborn Engineers have developed the application of Power Driven Brushes to centerless grinding machines. This new "centerless brushing" removes sharp edges, burrs and residue—produces micro-smooth finishes on a mass-production basis. It can be applied to many sizes and types of parts, using wire, natural or synthetic fiber Osborn Brushes.

Investigate the possibilities of this important new technique today . . . to cut your production costs! Write, wire or phone

THE OSBORN MANUFACTURING COMPANY
Dept. 226, 5401 Hamilton Avenue, Cleveland 14, Ohio

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY • POWER DRIVEN BRUSHES • PAINT BRUSHES • MAINTENANCE BRUSHES

New di-acro
POWERSHEAR
OFFERS
CONTINUOUS ACTION
Plus VARIABLE SPEED

from 30 to 200
strokes per minute

for high speed
"DIE-LESS DUPLICATING"

DOES PRECISION WORK ON ALL SHEARABLE MATERIALS:

MICA
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SILVER
MAGNESIUM
COPPER
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SILICON STEEL
CHROME MOLY
LEADED BRASS
STAINLESS STEEL
and many
other materials

When you see the remarkable speed and accuracy of the new Di-Acro POWERSHEAR in the production of small parts and pieces, you will join the mounting chorus of approval this versatile unit is receiving. Consider these points:

1. **CONTINUOUS SHEARING ACTION**—no clutch to engage—a marvelous time-saver! Feeding speed determines shearing speed.

2. **VARIABLE SPEED**—cutting cycle quickly set at speed of maximum efficiency for each shearing operation.

3. **EASE OF OPERATION**—with correct cutting speed on each job, fatigue is reduced, accuracy increases, production soars.

4. **SINGLE STROKE SHEARING**—non-repeating safety clutch allows "single stroke" operation for jobs that do not lend themselves to continuous shearing.

Regardless of larger capacity shears which may now be in use, any plant doing high speed precision shearing on smaller parts cannot afford to be without the DI-ACRO POWERSHEAR. This precision machine is available in 12" and 24" shearing widths with capacity for 16 gauge sheet steel. Also offered in standard model with single speed.

Send for 40 page "DIE-LESS DUPLICATING" catalog giving full details on Di-Acro Powershears, also other Di-Acro Precision Machines as illustrated below and offered in a wide range of sizes.

Pronounced "DIE-ACKRO"

O'NEIL-IRWIN MFG. CO. 311 EIGHTH AVE., LAKE CITY, MINN.
Manufacturers of DI-ACRO

advertising his shop. The boy tells how he was treated and how much he learned and if Ed treats him right he brags Ed up to the skies.

But Ed is scared of himself. And probably a little jealous. He is afraid that he will train a boy and then he will go to another shop and Ed is scared of what the boy is going to say about how he was treated. Ed is afraid that some of his pet (and secret) methods will get to other shops. (Methods that should have died with the first World War.)

There are just so many capable machinists in the business and as they die off, or retire, someone has to take their place. The good ones are college trained and get a good part of their training in practical work in shops like Ed's during their summer vacation. Ed cannot expect to get his share of the newcomers without doing his part of the training.

I have used boys during their vacation and then went back to his instructor and asked for him again the following summer. They knew their limitations and were out to learn. We both came out ahead, both in ideas and financially. I have also hired expert (?) machinists who said that they had eight or ten years experience that did not know how to shift the belt on a lathe to change the speed.

Ed's own favorite baseball team hires a likely looking college boy for the summer and possibly farms him out to a minor league team for training only to have him jump to a rival club after he gets his seasoning.

No, Ed will have to learn to pull his weight in training the new crop as well as reap the benefits of other shops' educational efforts.

Chas. O. Rankin
Ontario, Cal.

•

Helping young folks to learn about business and shop methods is the best way to insure that some day in the future company policies governing shop conditions will improve as these youngsters graduate from college and take over the reins of industry.

Naturally some of them will fall by the wayside and will be troublemakers in the shop while working during the summer vacation. The shop experience that these college boys can obtain from a willing and co-operative group of men can mean much in the way of assistance to the boys in their engineering courses. Theory is a wonderful thing but to have theory alone is next to being an educated fool. You can not make theory work all of the time. Some-

DETROIT BROACH ENGINEERS WILL *Cut Your* PRODUCTION COSTS *5 ways*

NEW BROACHING APPLICATIONS:

1 APPLICATION ANALYSIS—Detroit Broach application engineers will help you to develop new broaching applications in your production processing. Their recommendations are accompanied with actual production data and costs to help you determine your savings beforehand.

PRESENT BROACHING APPLICATIONS:

2 INCREASED PRODUCTION—Detroit Broach will study your present broaching applications to determine means of increased production from them. This is often possible through improved work-clamping, multiple loading of work on each machine slide and many other ways.

3 INCREASED WORK LOAD—Often, Detroit Broach can show manufacturers how they can increase the work load on their broaching machines through the design of universal-type tooling that is quickly convertible to more than one part. This can make it economical to broach a number of low-production parts whose sum production would keep equipment busy full time.

4 INCREASED BROACH LIFE—Often tool life can be increased by changing chip load, length, hook, etc., of broaches. In addition, the steel used and its heat-treatment are extremely important in tool life. Detroit Broach engineers will study your broaching applications and make recommendations for these changes wherever they would be advantageous.

5 LOWER BROACH REPLACEMENT COST—Through redesign of broach tools, forms can be broached progressively in one stroke by a number of inserts, each containing part of the form. This simplifies the form in each insert which decreases the original cost of the tools, cuts broach sharpening time. If any part of the form is damaged or worn, only that insert need be replaced.

The engineers and complete facilities of the Detroit Broach Company are at your disposal to help you get more production per hour and per dollar . . . on new as well as present broaching applications.

Detroit Broach Company specializes in the design and manufacture of broaches and broaching tools exclusively. Through this specialization their engineers are qualified experts on all types of broaching on all types of broaching machines. Some of the tooling principles that have emanated from this knowledge have been the great advancements in modern broaching. The consistent success of this tooling has made Detroit Broach the world's largest manufacturer of broach tooling exclusively.

Why not take advantage of the services shown at the left and have one of our application engineers make his recommendations in your shop. Many of the country's leading manufacturers have already found it a sure way to reduce production costs.

DETROIT *Broach* COMPANY
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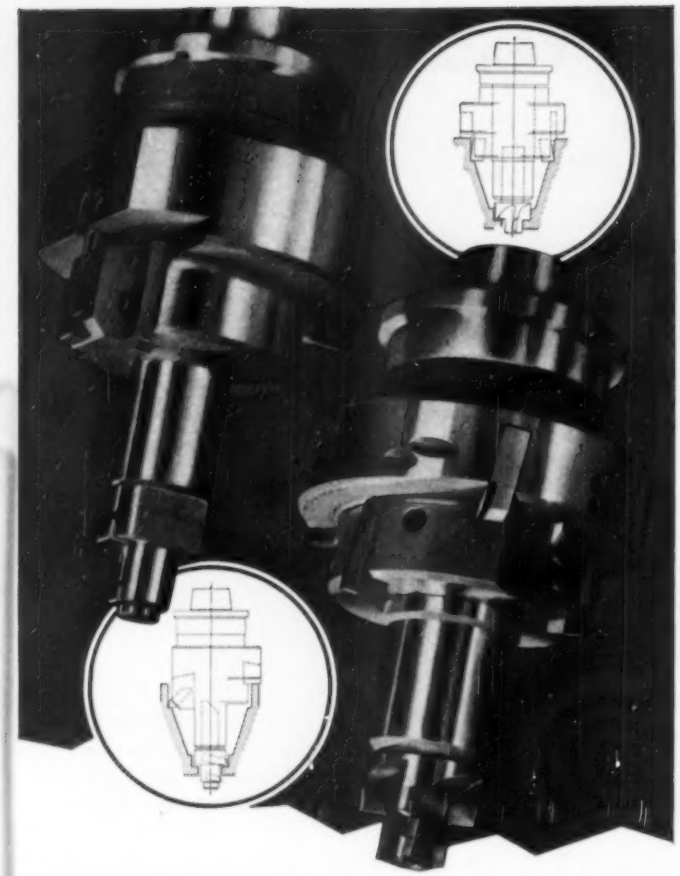


They cut the METAL . . . cut the COSTS

Alarming facts about obsolescence of machine tools have recently been published.

You may or may not be able to replace your obsolete machines. But in either case, remember it's the tools in those machines that cut the metal. They'll cut costs too . . . if efficiently designed. Quite often it's the tooling that makes the difference between profit and loss.

A striking example of how an existing machine was re-tooled for greater productivity is shown here. Designed and built by Gairing, they are two of ten multi-operation tools made to fit a two-way, four-spindle, roughing and precision boring machine making tractor parts.

The success of this well planned tool set-up resulted in an immediate order for more such up-to-the-minute tooling from the same client.

Gairing's representatives and tool engineers stand ready to see what can be done for you . . . to design and build for your *new* machines or for your *old* . . . the tools that cut the metal, cut the costs.

The Gairing Tool Company, Box 478, Detroit 32, Michigan.

Also Manufacturers of:
STANDARD END CUTTING TOOLS
QUICK-CHANGE BLOCK-TYPE BORING TOOLS
E-CON-O-MILL STANDARD FACE MILLS
GAIR-LOCK FINE TOOTH CUTTERS

GAIRING TOOLS

how or other in actual life one never finds that ideal condition under which to perform the task as outline in the theory. So our theory fails to help us after a certain point. Then practical experience is needed to carry on to give us the solution.

Colleges today are finally realizing that to instill in a student only theory is a very sure way to keep him from becoming immediately successful upon graduation. Those colleges that teach only theory set a man back at least two years after his graduation since he must spend approximately that much time in learning the practical side of plant operation and how to get along with the men in the shop. These men are usually older and have much practical experience which is one reason why they are often so set in their ways as to the proper method of doing things.

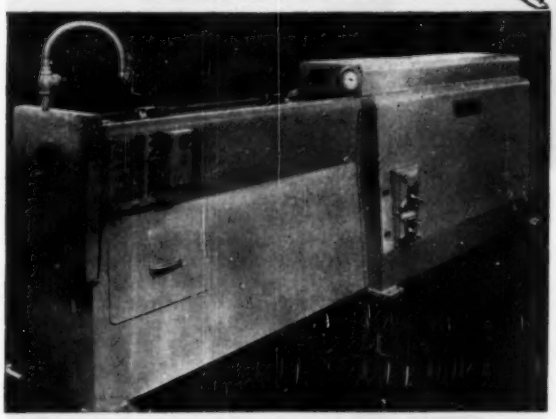
Our young graduate too frequently fails to realize his own shortcomings and has many setbacks before acquiring his practical education through the school of hard knocks. Upon graduation his mind is too often made up as to his own qualifications and to the minimum salary that will be acceptable to him. He is a graduate of a recognized college and feels, in his own mind, that he is, therefore, qualified to meet the world.

However, he finds only too often that business concerns are not looking for men possessing only theory and an engineering degree. After many disappointing interviews, the young engineer frequently finds that he must start well down the ladder and spend two or three years gaining practical experience. This is a most unsatisfactory condition and it would be more satisfactory if there were a larger number of co-operative institutions. This type of education usually requires an additional year of schooling but since the practical experience is gained along with it and a chance to earn at least a portion of his own expenses, the engineer or business administration graduate is ready for a good start in industry. He has some experience in addition to his theory, he has worked with shop men and knows how to solve shop problems.

Industry wants this type of man and needs them to help build up the industrial world. When you as a shop foreman have an opportunity to help a youngster learn about shop work, don't think that you are wasting your time. You are definitely not. You will most likely be repaid one-hundred-fold by better conditions, better supervision and better management. Of course there will be some deadheads, but those who work

IT USED TO TAKE A MAN A MONTH

IT NOW TAKES 15 SECONDS



The standard HP 30 LAPOINTE Broaching machine, tooled up with broaches designed by Lapointe engineers, will accomplish wonders on any production run or on difficult short-run jobs.

That's right . . . Lapointe engineering is responsible for the fact that only 15 seconds are now required to completely cut this difficult lamination die, in one stroke of the LAPOINTE broaching machine! An amazing reduction in time — *and cost* — when you realize that it formerly required a month for a skilled die-maker to shape the 12 thin, very exacting contour slots, four of them different from the others!

This is a typical job for the LAPOINTE

"H-P" HORIZONTAL BROACHING MACHINE which is designed for maximum VERSATILITY

The "H-P" is especially suited to *any spline job*, but you will find it virtually an all-purpose machine for internal and external broaching.

If you are one of those men who have thought they couldn't use a broaching machine, let us tell you about the important features of the machines comprising our "H-P" Series. You'll be agreeably surprised, for it is often possible to recover the entire purchase price *by the actual savings on a single job!*

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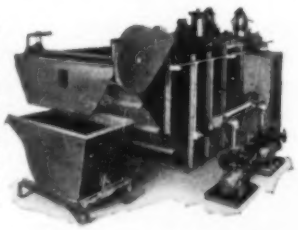
The Actual Savings Record of One Plant Using HOFFMAN Flotation Equipment

Based on One Year's Operation of 7 Centerless Grinders

	BEFORE	AFTER	SAVINGS
Total Shifts Operating	2860 hrs.	2860 hrs.	
Total Wheel Dressing	2860 hrs.	1450 hrs.	
Labor for Dressing	$3,646.50	$1,823.25	$1,823.25
Time for Cleaning Coolant Tanks	954 hrs.	NONE	
Labor for Cleaning Coolant Tanks	$1,216.35	NONE	$1,216.35
Grinding Wheels (est.)	$1,556.00	$1,356.00 (est.)	$200.00
Diamonds (est.)	$1,100.00	$900.00 (est.)	$200.00
Soluble Oil	$915.00	$715.00 (est.)	$200.00
MAINTENANCE SAVINGS (Annual)			$3,639.60
PRODUCTION SAVINGS Based on 3,814 hours saved, evaluated at $5.00 per hr. per machine			$19,070.00
TOTAL SAVINGS			$22,709.60
INSTALLED COST of Hoffman Flotation Unit			$9,488.60

Get the Figures for *Your* Operations

Detailed cost records kept by one manufacturer revealed these phenomenal savings with a Hoffman central system for coolant clarification. Along with better quality and faster grinding, this plant saved production labor formerly wasted on cleaning individual sumps. A Hoffman flotation unit provided automatic clarification with the amazing economies shown above. These same cost-cutting economies can be obtained in your plant. Write *today* for literature and a FREE Hoffman filtration engineering survey.



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well will offset these few who don't.

Let's get in there and help when we can, to teach our young engineers-to-be the principles of actual shop practice and how to work with shop men.

Charles D. Townsend
Fort Wayne, Ind.

•

HOT POTATO

It was Ed's own blunder that put him in the position he finds himself in this problem. It is certainly the foreman's duty to schedule vacations so that his leader or key men are not out the same time as he is. Ed would not enjoy his vacation with this hot potato on his hands. There are a few possible solutions to this problem to get the job done efficiently and to everyone's satisfaction.

First—Ed should get together with Benson and Jenkins and explain the situation to them just as the Old Man told it to Ed. He should ask their opinion and tell them someone had to take care of this very important job. Ed should explain he is willing to go halfway with them if they will help him out. He should explain to them that someone with their capabilities should be on hand when he is not there. Ed should also tell them that he needs the benefit of their experience and efficiency. This will make them feel important and will probably find them in a receptive mood to make a change in their arrangements.

Second—An offer by Ed to change his plans until a later date as fishing season still has a month to go. This would give him the opportunity to see that the job did get started and that the other fellows could carry on from there.

Third—Talk it over with the old man himself, admitting his own error of judgment in scheduling vaca-

"Hey Mac! C'mere a minute and bring your torch!"

CLEANER WORK

NO PARTS
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WATER SOLUTION USED
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Parts for this hydraulic coupler are machined with the aid of Antisep All-Purpose Base mixed 1:10 with water. This cutting fluid replaced a straight cutting oil both in the coolant reservoir and lubricating system. They formerly used a drum of oil every 3 days; now use a drum of the diluted Antisep Base, at less than half the cost, which lasts a week. That's economy!

Incidentally, Houghton "O" ring packings are used as seals in these couplers. For full data on how Antisep A.P. Base can save you money, and give you these other advantages, write E. F. HOUGHTON & CO., Philadelphia 33, Pa.

HY-PRO ENGINEERING increased production from 1,000 pieces per tap to 12,000 pieces per tap

PART: Check nut for air-conditioning fan blade.

PROBLEM: Stringy consistency of 1020 steel caused the 3 and 4 flute taps, used on this job, to pick up and seize often breaking the tap on the 1st or 2nd piece. Production never exceeded 1,000 pieces per tap. Did the Hy-Pro Sales Engineer think it possible to design a tap that would increase output per tap?

HY-PRO SOLUTION: Samples sent to the Hy-Pro Engineering Department were studied and tested. They suggested using a two flute spiral point tap with a special Hy-Pro finish. Manufacturer reports average production per tap now exceeds 12,000 pieces.

Above is a typical example of how the Hy-Pro Sales Engineer can help increase threaded-hole production. His expert engineering counsel backed by the most up-to-date tap production methods combine to solve tapping problems rapidly and profitably.

All Hy-Pro Taps are ground from tough uniform quality high-speed steel and given one of the Hy-Pro exclusive surface treatments.

Each tap is completely inspected by the latest electronic quality control equipment, your assurance that there will be no dimensional variance in Hy-Pro Taps of a stated size.

These precision manufacturing methods plus the ability of the Hy-Pro Sales Engineer to prescribe the correct tap for your particular job means *sustained accuracy* on your production line resulting in higher productivity from your tapping machines.

Let Hy-Pro solve your tapping problem—call a Hy-Pro Sales Engineer today.

Order from your distributor.

HY-PRO TAPS

HY-PRO TOOL CO.
NEW BEDFORD, MASSACHUSETTS
A SUBSIDIARY OF CONTINENTAL SCREW COMPANY

tions which found all key men going around the same time. The old man will probably respect Ed for admitting his own error of judgment and may come up with some solution satisfactory to all concerned. However, I feel if properly presented by Ed it could be worked out without too much hardship or discontent by anyone. This calls for the friendly approach on Ed's part, the acknowledged error in scheduling vacations, an appeal to Benson and Jenkins that he needs their help. With the pat on the back, rather than the slap in the face or driver method, he will find how helpful people try to be when honestly appreciated.

A. E. Salmons
Philadelphia

•

When hot weather rolls around and vacation time has been looked forward to all year, a fellow feels that he is entitled to take his allotted period and enjoy it in his own way. This of course provides one of the incentives of work, otherwise the daily routine would become dull and monotonous, ultimately causing discontent, and thereby lowering morale and consequently hampering production. Furthermore, a vacation, with its change of pace and scenery, revitalizes the body, while the relaxation it affords is a welcome change from a job which tends to become boring going through the same motions day after day.

Ed, however, must realize that the Boss himself has been placed in a tough spot. Continuation of business requires that no profitable job be turned away; and if a rush job, satisfactorily completed, will result in additional business, the Boss is under the compulsion of accepting that job and seeing that it is handled properly and the customer's requirements met.

Naturally he would turn to the one best qualified to oversee the work—and that would be the foreman.

It is unfortunate that vacation plans would have to be interfered with, but in the long run it is better to give up a present vacation, however distasteful the sacrifice might be, than to be faced with loss of work and a possible permanent vacation—which would not be too pleasant to contemplate.

Benson and Jenkins, too, should understand what they are up against. And if they have been treated fairly in the past, and the situation is presented to them tactfully by Ed, and with a request for their cooperation, it is likely that they would forego their fishing plans, or at least take a

SHAVING ASSURES BETTER GEARS AT A GREATER OVER-ALL

Production Economy

This gear shaving machine, the first of its kind, was introduced 16 years ago to fulfill the urgent need of gear manufacturers for a means of correcting precision gears and gears produced to operate under critical loads and speeds—these corrections to bring them within required tolerances.

Today, it is being used by all the leading manufacturers in the automotive industry, the majority of gear jobbing shops and nearly all the machine tool builders.

One gear manufacturer says shaving has reduced rejects which formerly amounted to about 50% to none. Another says that shaved gears have cut operating power requirements approximately 20%.

Gear shaving eliminates the need for skilled machinists, regardless of the degree of precision required. Accuracy does not depend on the shaving machine operator. Shaving also makes it easier to turn out acceptable gears. The teeth of shaved gears have uniform accuracy and the characteristics of all the gears in any lot will be uniform.

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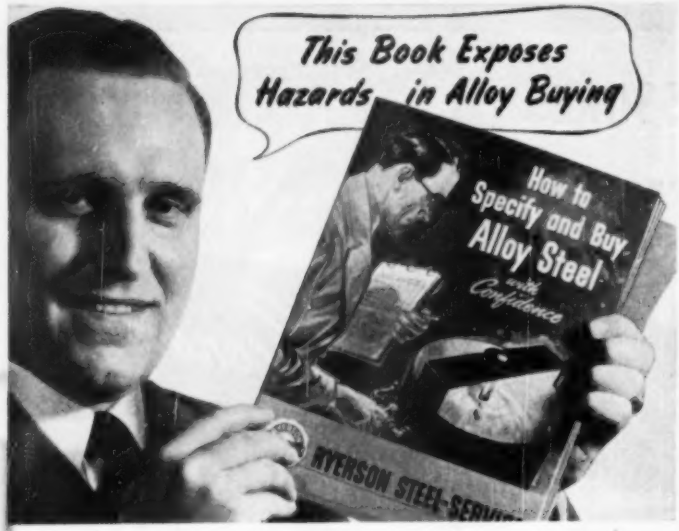

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later vacation, even though not of quite the type they had planned. They must realize that their pay envelopes are not filled with manna from Heaven, a free gift from above, but that they are in compensation for work produced, and that a continued pay necessitates continuing production, which can only be accomplished by a succession of new orders.

Also, despite the interruption or abandonment of their anticipated vacation, Benson and Jenkins should feel flattered that their services are in such demand that they cannot easily be dispensed with.

True, monetary remuneration is one of the considerations for doing a day's work, and job security is another factor, but there are some things which money cannot pay for. And the feeling that a worker is depended on in pinches, such as the one that now confronts Ed, Benson, and Jenkins, is one of those things.

But to sum it up, the three of them should resign themselves to the inevitable fact that a job must be done, and they are the ones best fitted to do it. Their loyalty to the shop demands their renunciation of their vacation at this time. To console them for this, perhaps the succeeding vacation could be extended for a longer period.

Milton E. Sussman
Brooklyn, N.Y.

•

HOT POTATO

A "hot potato," if given a chance to cool off, may be more easily negotiated for ultimate consumption. The "hot potato" job dropped in the foreman's lap may seem at first to present insuperable difficulties in solution. However, there are several devices and methods for handling the situation. "Split" vacations or postponements are usually the most satisfactory expedients, depending on the loyalty and cooperation of the men involved, and the skill of the foreman in making the necessity of the use of these schemes understandable and palatable to the workers.

However, the necessity for using these devices to meet emergency conditions could have been avoided if a carefully planned vacation schedule containing a "safety factor" would have been established. In arranging a vacation schedule so that the sequence of vacations for the workers will cause the minimum amount of disruption of the flow of work in the department, a definite leeway should be allowed to cover any emergency jobs which may arise. The foreman should contact those of his men entitled to the annual vacation and make arrangements that are

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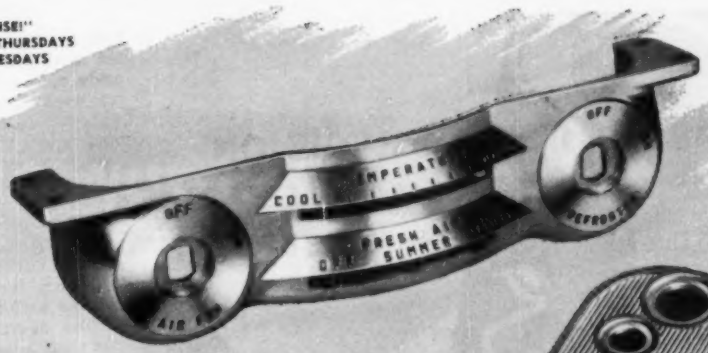

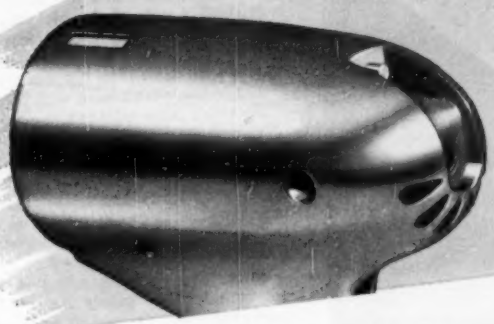

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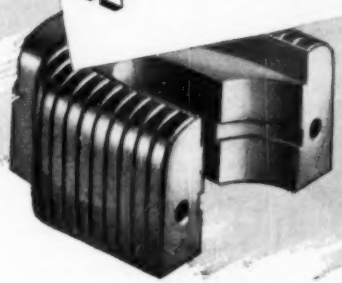

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both satisfactory to himself and to the workers. Once the men have made their personal plans for definite weeks, it may be inconvenient to alter the schedule. However, by making the initial schedule flexible enough to cover any "hot potato" jobs through allowing extra time in the rotation of vacations, the difficulty may be met and overcome.

Most foremen follow the usual well-established procedure of asking their men, well in advance of the vacation period, the particular time off they desire. The men can then plan their leisure, and the planning is in itself a part of the pleasure to be gained from the vacation. Through the vacation schedule, the foreman can also plan his work better, knowing which men will be out at specified intervals and can make certain there is no overlapping of too many men out at the same time. By insertion of a "safety factor" of time, to cover emergency or unforeseen special work, in the sequence of vacations, a more effective vacation schedule will be established.

Where the vacation schedule did not contain the "safety factor" for emergency jobs, it may be necessary for the foreman to request the specified workers, who are best able to handle the special job, to postpone their vacations to some more opportune time. In this connection, the "split" vacation may be beneficial in handling the situation. A problem of this nature requires the demonstration of real foremanship. The foreman is certainly on the horns of a dilemma in endeavoring to meet company needs in getting out the emergency work and still keep his top men satisfied on the vacation question. It is believed that the best solution in connection with meeting the date on the hot job would be to ask the experienced men required to do the job to work through their vacations, and take them at a later date, or "split" their vacations.

The "split" vacation arrangement is especially adaptable in meeting the needs of the employer who may be faced with emergency jobs during the summer vacation months, and also may meet the requirements of an employee who desired to take his vacation at several different times throughout the year. However, many concerns require their employees to take advantage of the vacation privilege at one fixed period. If, however, the employee is allowed or requested to work, he should be given his vacation compensation in addition to his regular salary or wage. As a rule, there is no prevailing policy with respect to

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the standard of comparison!

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However, the men who actually operate the machines at rod consuming shops, who buy rod from more than one mill and who are really in a position to make true comparisons say, "THERE IS A DECIDED DIFFERENCE." Many of these consumers operate their machines on the same parts for long periods, and gradually the product of one particular mill BECOMES THE STANDARD OF COMPARISON for BRASS ROD of all mills.

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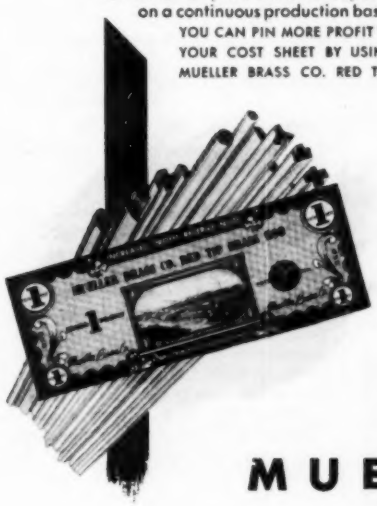

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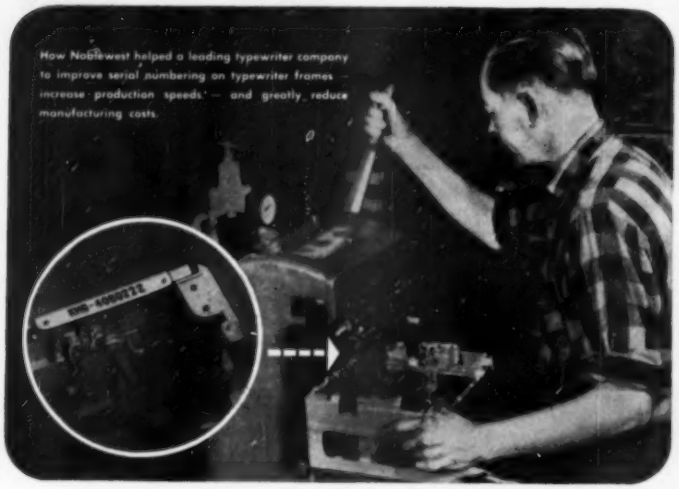
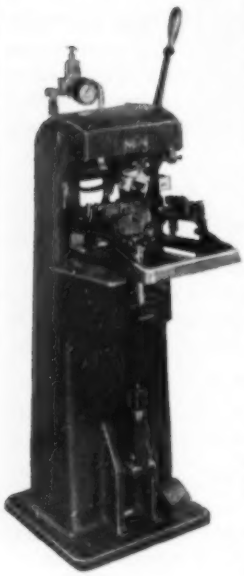

How Noblewest helped a leading typewriter company to improve serial numbering on typewriter frames — increase production speeds — and greatly reduce manufacturing costs.

SERIAL NUMBERING 600% FASTER



Here is another example of how Noblewest marking equipment pays big dividends in faster, better marking at greatly reduced manufacturing costs—with resulting savings that often pay for the cost of the equipment within a year or less.

A Standard Noblewest No. 4P general purpose marking machine was tooled for roll marking consecutive serial numbers permanently into die-cast typewriter frames—with a resulting 600% increase in production speed over the method previously used. Features of this Noblewest marking equipment include rocker-style numbering head with newly developed indexing mechanism for automatically advancing serial numbers at each stroke of the machine. The operator needs only to make the initial setting of numbers. Pneumatic table pressure assures positive uniformity of depth of inscription and compensates for slight variations of part thicknesses. For information on how Modern Marking Methods can cut costs in your plant, write the Noble & Westbrook Mfg. Co., 17 Westbrook Street, East Hartford 8, Conn.

(left) Noblewest Model 4P shown tooled for automatically serial numbering typewriter frames

(right) Noblewest precision-built rocker-style automatic numbering head

MARK IT BEST WITH NOBLEWEST

NOBLEWEST IMPROVED MARKING DEVICES

EQUIPMENT FOR MARKING · GRADUATING · EMBOSSING · NUMBERING

splitting vacations. In some concerns, it is welcomed as a means of reducing the disorganization that frequently results from regular vacation procedure. Other firms indicate that "split" vacations nullify the whole purpose of the vacation system from the viewpoint of management, in that they do not promote complete relaxation away from the job. Some plans allow two but not more vacation periods in any year.

It has been my experience to have had an employer who provided vacations for all eligible employees at the same time, shutting down for the duration of the vacation period. Most plants, however, stagger vacations and thus avoid the necessity for a shutdown.

In most cases, a vacation with pay should not be granted unless the worker will use the time for recreation; neither should the option be given of accepting extra pay in lieu of a vacation. This practice negates the beneficial effects gained from the vacation plan.

Good foremanship in assuring continuous production requires the setting up of a flexible vacation schedule; one which will permit beneficial and justly earned vacations for loyal, conscientious and deserving employees and at the same time meet company requirements for continuous operation.

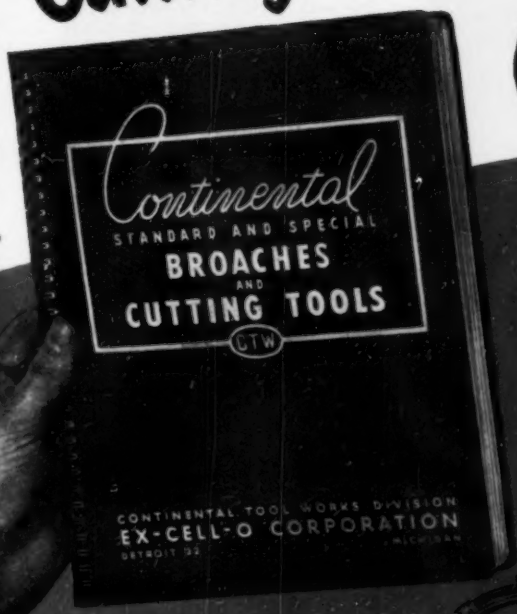
There is no substitute for experience. When company needs require the services of specially experienced employees for an important emergency job during their previously scheduled vacation period, it is believed that loyal and cooperative workers will certainly pitch in and help the foreman split the "hot potato" at the expense of a split vacation.

Harry Kaufman
Philadelphia, Pa.

•

THE MAIN reason why Ed was chosen by the Old Man to head up his department, was that the big boss knew he could depend on him to get the work out and get it out right. So Ed, on reflection, will get over his temporary "soreness" at losing his vacation and get down to business, especially when he knows the company can use the business the prompt completion of this order is likely to bring. In these days, when the pendulum of business is slowly, but surely, swinging toward a buyer's market, management cannot afford to neglect the signs and shape its policy accordingly. Ed, as a part of management, should be big enough to accept his vacation postponement as one of the minor annoyances that

Cutting Tools—and More Cutting Tools!



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THE ONE-MAN-GANG

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management has to put up with, in order to keep things running.

With regard to these two top men of his, if they really are being groomed for promotion, they would be foolish to jeopardize their standing with Ed and the company by walking out when their efforts are so urgently required. While there is a consideration of loyalty involved here, both to Ed and the company, self interest should also not be neglected. These two boys must have worked hard to be in line for promotion—why toss their chances away because of a postponed vacation?

Returning to our friend Ed again, I wonder if he would really enjoy his vacation if he started the job and left for the trip, leaving Benson and Jenkins to carry on and complete it? If he is the conscientious type I am willing to bet there wouldn't be an hour of the day—even while the fish were biting—that didn't find his thoughts back at the plant. Wondering how things were going, and if the Old Man would be sore at him leaving the job to his understudies. Yes, a man who really concentrates on his job fifty weeks of the year, year after year, can find a lot of things to worry about when he takes his vacation under the dubious circumstances set forth in Ed's little problem!

How about split vacations? Some people like them—for instance, the fellows who go for fishing and hunting, and seasonal sports like skiing. I know one man who takes a week off in the summer, and keeps another week in reserve for the World Series.

But in the main, most people like to have their vacation weeks run together. I think the tendency of most large plants in New England is trending toward the vacation policy of Old England—to close down entirely for ten days or two weeks, leaving only a skeleton force of maintenance men to do overhaul and repair work that cannot be handled during the other weeks of the year. I think the ideal time for the vacation shutdown would be those two weeks when the mercury climbs highest and ambition has a tendency to ooze. Maybe some day our long-range weather prognosticators will really be able to forecast the weather months or weeks in advance and the industry will lay its vacation plans accordingly.

But in the meantime, Ed and his two henchmen would do well to string along with the Old Man, and he in turn will not be found wanting in appreciation. It very seldom fails.

Robert S. Alexander
Greenville, R. I.

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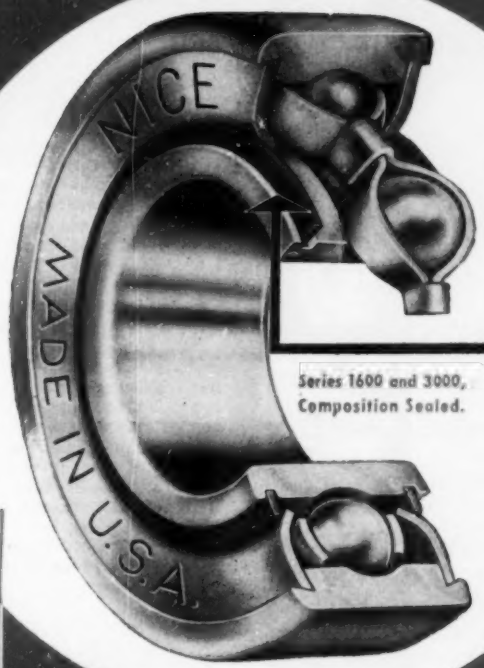

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A. M.

SUBORDINATE DICTATOR

If Morrison is an expert on machine tools, Ed is doing the right thing when taking Morrison's good word for granted. By doing so, he is making himself free for other and perhaps more important business. This does not make Morrison any dictator. It seems to me that Al is trying to gain a position as such. It is not Al's business to tell Ed who is to have charge of the repairing of the machine tools.

Assuming that Al was not promised to have charge of the repairing of the machine tools when he was engaged as foreman, his talk about dictatorship, etc., is only hot air. If I was Ed I think I would tell him how to behave.

Giving subordinates responsibility is in many cases the same thing as adding to the company's profit; they produce more if they feel their boss has confidence in them. Of course, before such responsibility is passed on to a man the executive must test each man and follow up his activities to convince himself that he is not turning over duties to persons who are not capable of handling such responsibility.

A. E. Fristedt
Stockholm-Angby, Sweden

•

So Al frowns and gripes because Ed has delegated the repairs and upkeep of the machinery to Morrison. Oh you, Al, you are all wet again.

In discussing this subject between these two, it is, in a small way, exactly what the executive of a large corporation is bound to do every day.

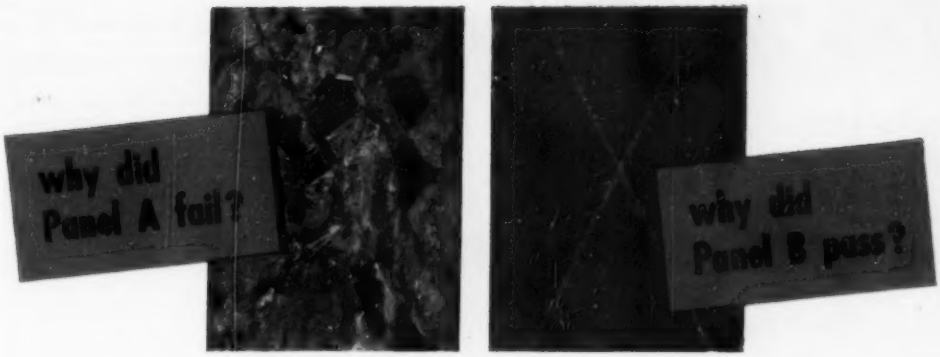
If Al had had any experience with maintenance, he would recognize that it requires more than one man of good training to head the gangs of definite trades and callings necessary for such work.

And, no matter how great is the rush, it requires time to make good permanent repairs. Let's cite a case:

A high-up executive had four gripes at his desk when he arrived at his office one morning. He called the plant engineer to his office by phone and asked why this situation, and who was responsible.

The plant engineer replied that it was all up to him, only to hear the pleasant words: "You are a hell of a plant engineer. I don't see why you are not keeping ahead of the game and having these things fixed so they don't hold us up."

Naturally this was resented and for an answer he replied that a belt could not be repaired until it broke; a thief could not be arrested until he had committed a crime; a nurse



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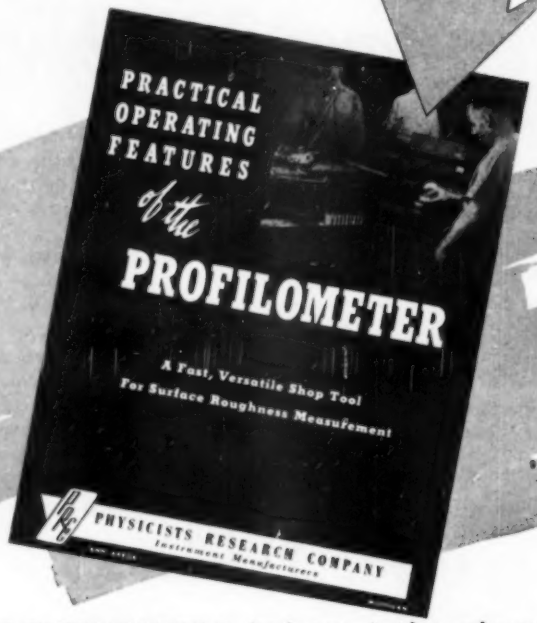

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could not perform first aid until an accident happened; a new part could not be made and placed in a machine until the old one gave out. Then other items were called to his attention.

The executive saw the philosophy of the situation and said, "I guess you are right and I'm wrong. Have a cigar; they are my choice ones."

However, there are exceptions to this rule.

For instance, it may be determined how much product can be turned out by means of some certain appliances before they must be replaced by others. In such cases, spares should always be in waiting.

A few usual instances may be cited, such as motors being overloaded or for other reasons they may be burned out. Spares of these or slightly larger ones, in horsepower, should always be on hand. Many large plants which generate their own power have two prime movers so that if one fails, the other is ready to start. Preparedness, in such cases, is a magic word which may overcome many delays.

Quick repairs, as implied by Al, may be worse than none. A good conscientious millwright is a blessing in human flesh to any organization for good leaders are hard to get.

Apparently, Morrison is such a man and he seems to be looking ahead and so he will save trouble. It is no mistake for such a man to be in charge of repairs.

Again, Ed probably realizes that Morrison will not go beyond his depth in the day's problems and he will avoid trying to work in lines of endeavor which he does not know too well.

A number of years ago, the crankpin brass on a large Corliss engine burned out. True, it was the duty of the engineer in charge to have avoided this.

A rush order was immediately sent to a jobbing shop to make a repair. It would require eight weeks to get a new brass delivered.

An experienced man and an apprentice were sent from the jobbing shop to look things over. They decided that the best procedure was to fix up the old brass and use it as a pattern for casting a babbitt duplicate.

This was done, and while the new brass came at the end of eight weeks, it has lain on a shelf in the engine room for sixteen years waiting for the babbitt to break down. In the meantime, a generator has replaced the big belt pulley on the engine shaft and belts have retired to the outside shed.

Does Al think that one man could

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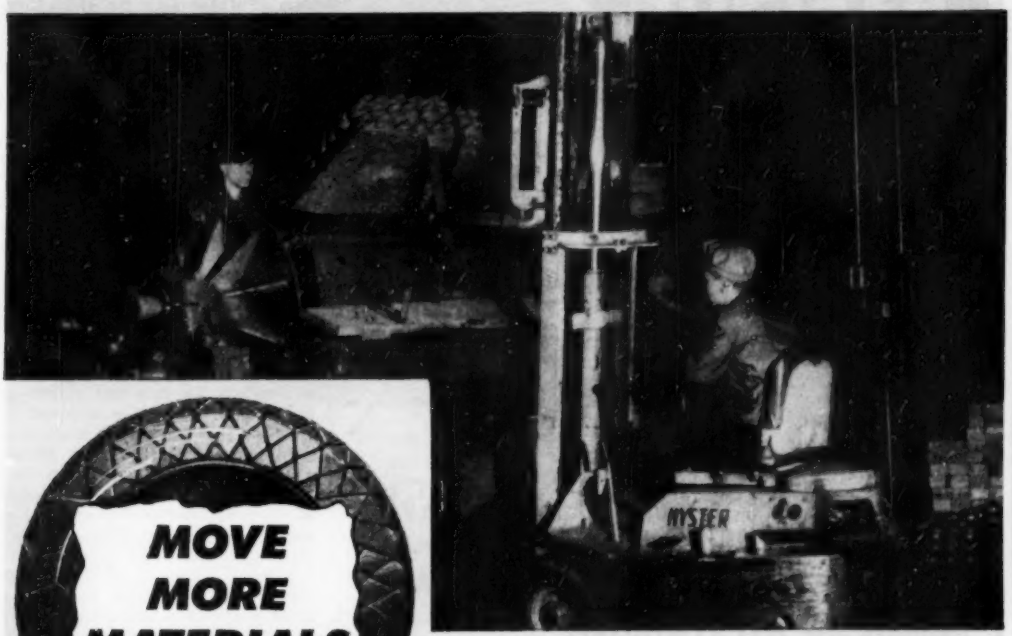

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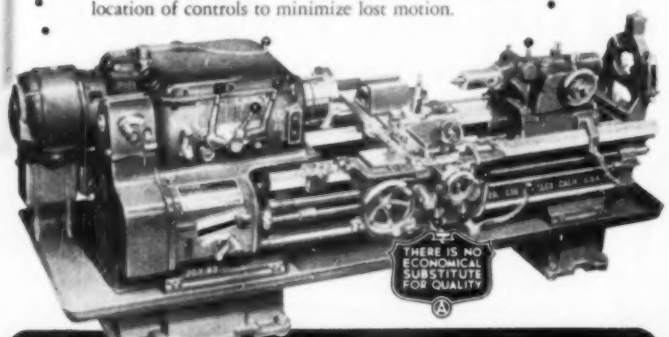

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act alone in these cases and be efficient. Does he think that big executives do all the work for which they are responsible?

No, Al. You are wrong and would be proven so in an indefinite number of cases. A division of duties is necessary, and so we say Ed has the right idea, for he seems to have the necessary executive ability required in his position.

F. H. Stebbins
Worcester, N.Y.

•

When Al is trying to convince Ed that he thinks Morrison is trying to dictate to Ed, is Al doing so from a basis of resentment toward Morrison? In his desire to have the lathe available for a big order, Al tends to overlook the fact that sooner or later this lathe must be repaired.

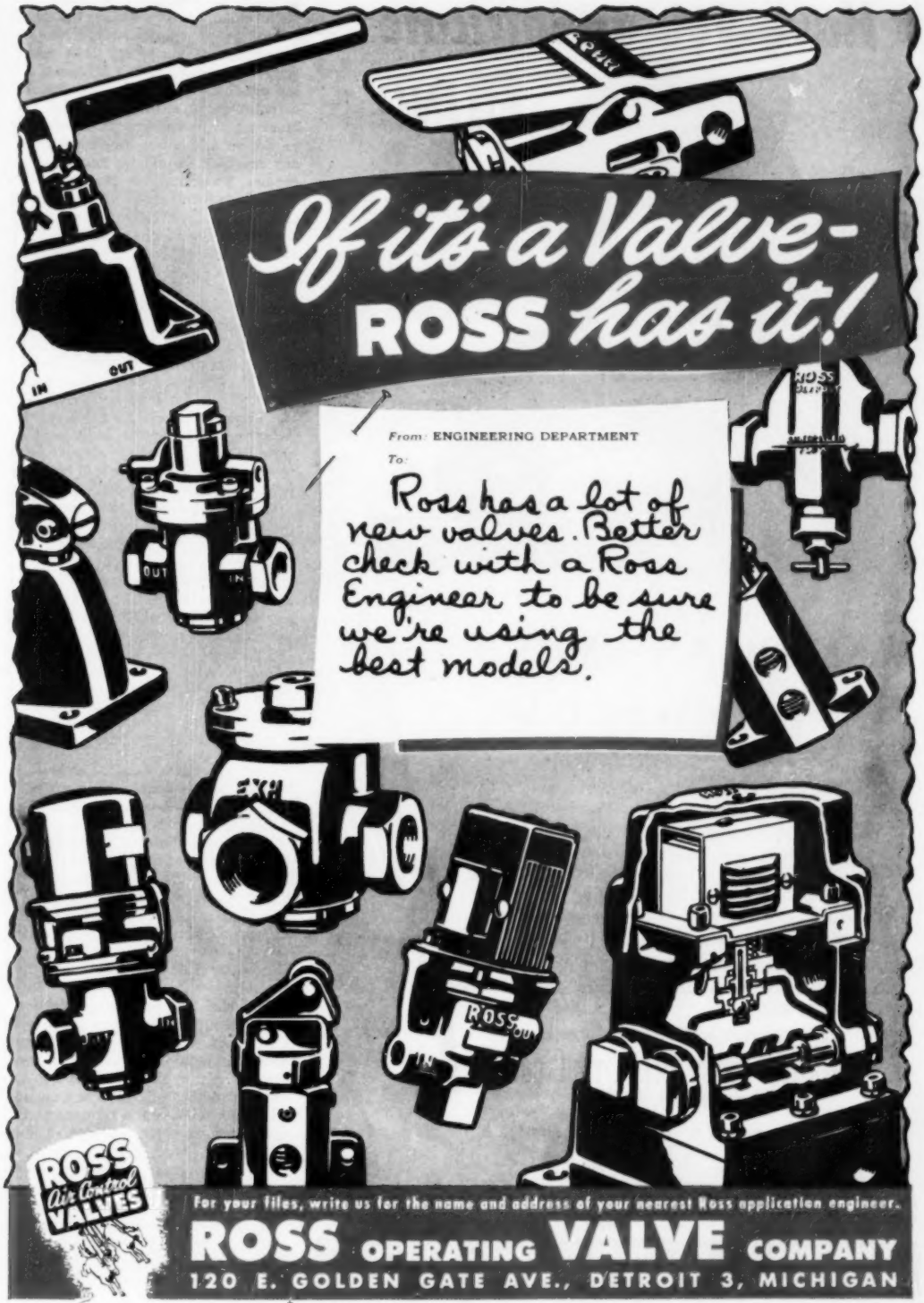
Ed, on the contrary, is displaying good judgment in assigning Morrison to act as maintenance man. Evidently Morrison's past performance in keeping machines running has proved that he knows his work and can be depended on.

It would be the height of folly to continue a machine in production when repairs are indicated, since if the lathe were run continuously in the effort to turn out a job in record time, a breakdown would inevitably occur, necessitating more extensive and more costly repairs than would have been necessary with preventive action, and probably keeping the machine idle for a longer period than if it had been overhauled before the job had been started.

Certainly Al would be anxious to have the new job begun and finished as expeditiously as possibly, hence his concern at having the machine laid up. But perhaps a simple explanation of the circumstances to the customer, pointing out that a slight delay at the start would in reality speed completion of the job, would convince him that a short waiting time would be more than compensated for in the end.

The customer would no doubt appreciate this frankness and be willing to wait, rather than to have the job start and then to be faced with an enforced delay, causing him to fret and worry about when the job would be finished. If the job had been started and then a breakdown had occurred, the customer would most likely conclude that a concern whose machines proved defective while on a run would not be a reliable firm with which to deal, and would take his future business elsewhere.

It is not, as Al seems to think, a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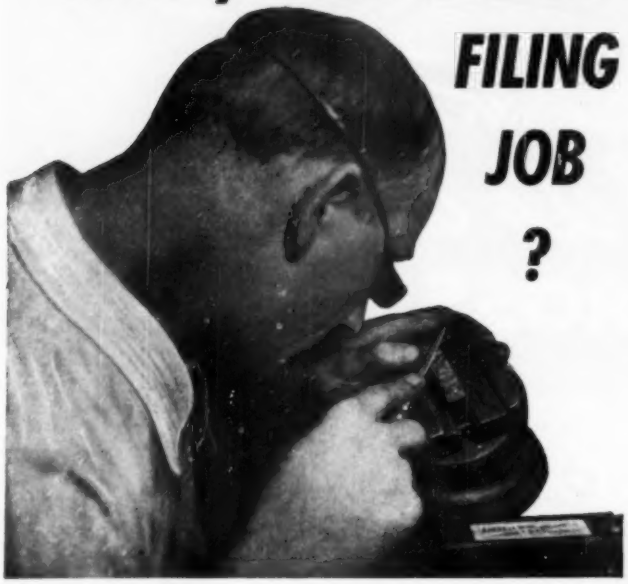

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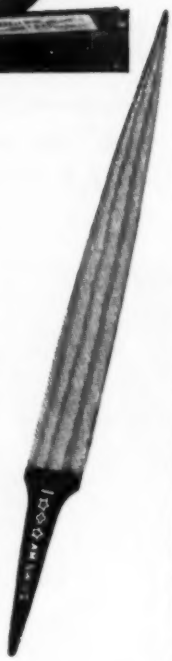

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question of Morrison's dictating to his foreman, or of Ed's being ordered around by an employee. Morrison's knowledge of machinery is a vital factor in keeping such machinery in top condition, as Ed has been quick to point out. Naturally, it is not in Morrison's province to issue orders to Ed or any other employee that any machine should be held up for repairs. The most he can do is to suggest preventive or remedial action, and let the decision remain with the foreman as to what course should be pursued—that is, keep the machine running or calling for downtime.

As Ed remarks, he is lightening his own load, and freeing himself for other important details, by letting a subordinate undertake a job for which he is qualified. When such an employee has proved his capability, his word should be given prime consideration; and Ed is doing the right thing in deferring to Morrison's technical judgment, even though Ed's acquiescence peeves Al.

Were Al in Ed's place and bullheadedly ordered a machine to run, having already been competently advised by a good mechanic of the ultimate result of so doing, Al would pile up a mountain of grief for himself before he would finally be compelled to realize that the better part of wisdom would be reliance on someone who knows what he is doing.

Milton E. Sussman
Brooklyn, N. Y.

•

Ed has the right idea. He evidently has found a most capable man who can be relied upon to repair and maintain machine tools, and very wisely has delegated the responsibility to him of deciding when and how a tool should be overhauled. Thus relieving himself of a heavy part of the load, and using the talents of a man who is better able to make an objective scrutiny of the machines than a busy foreman like himself.

The fact that this man, Morrison, has taken the trouble to prepare a machinery chart in order to get ahead of possible breakdowns, convinces me that Ed has found a pearl of great price, one of those rare individuals who take an interest and pride in seeing that the tools of production are kept running smoothly. Al to the contrary, I feel sure there are many shops that could use the services of "dictators" of this type!

In my own experience, I can recall shops where it was common practice to run the machines until they literally fell apart, and preventive main-

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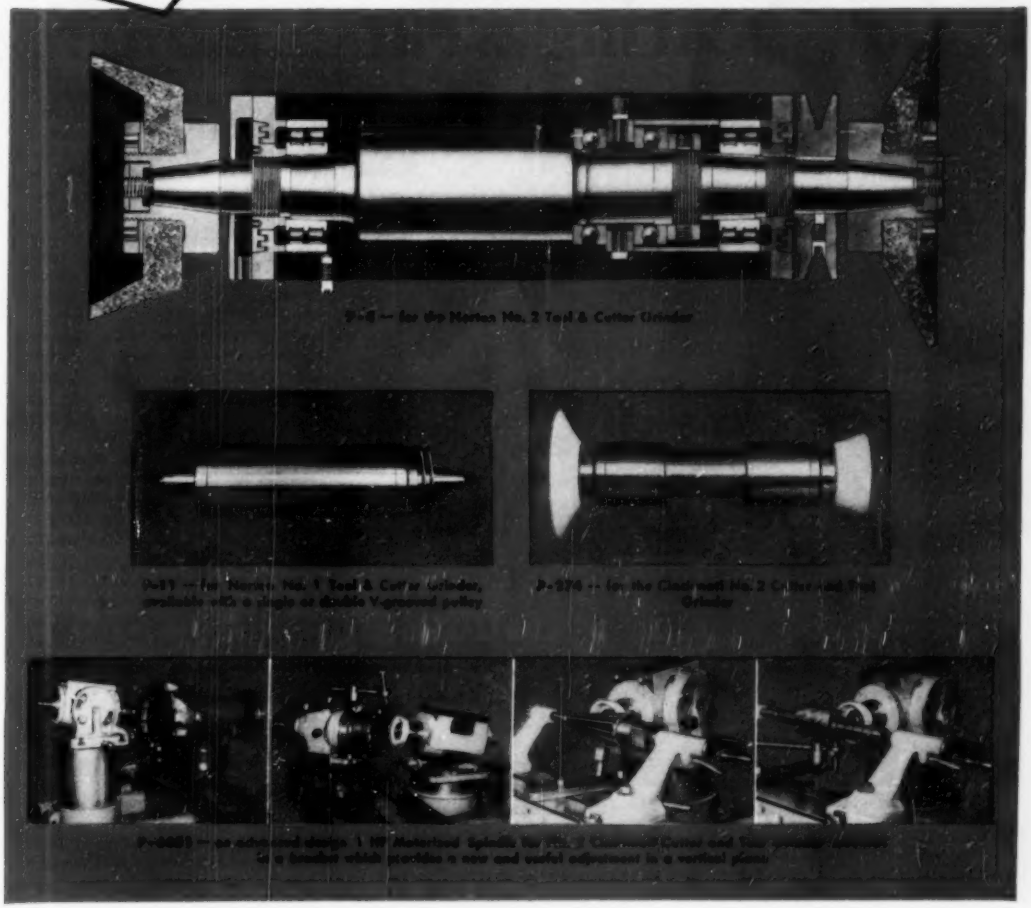

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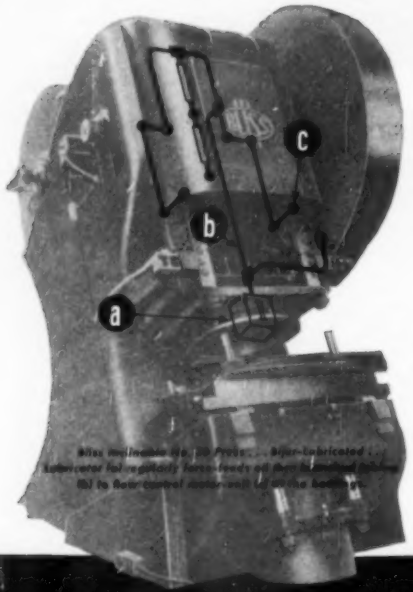

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tenance was something that just didn't exist. But, on looking backward, in nearly every instance the shops themselves have ceased to exist. Or else, the "run till they bust" individuals who held sway there have long since been replaced. It is a well known fact that the close tolerances required today cannot be maintained on a production basis without strict attention to maintenance "musts" such as replacing worn gibs, sloppy bearings, broken adjusting screws, etc. Anyone who has had occasion to view some of the war surplus machinery put up for sale can testify to the ill effects of improper maintenance or abuse by careless or unskilled hands. I have seen machinery built in 1945 that could only be salvaged by repairs costing thousands of dollars. At the most, these machines, taking into consideration round-the-clock operation, had only averaged several months use. Of course, during the war, men like Morrison were extremely scarce and with increased production facilities had to be spread over a larger area, with the result that the "nut-buster" mechanic came back to make his devastating presence felt again.

In the same issue of *A. M.* wherein this Round Table problem appears I read in Letters to the Editor the plaint of an old-timer regarding the abuse of equipment by the younger element who obtained most of their working experience during the war. Like all true craftsmen he had been taught to appreciate the value of a well-kept piece of equipment, and I think this respect for the tools of our trade should be enforced. Any foreman who tolerates abuse of equipment or poor plant housekeeping, to my way of thinking is laying up trouble for himself, and is most certainly not doing the job management has a right to expect.

That is why I say that Ed is using sound judgment by allowing Morrison to handle the maintenance of his shop equipment, leaving him free to concentrate on production. If there is any suspicion of dictatorship in the arrangement, as Al suggests, to my way of thinking it is a benevolent dictatorship, wherein Ed and the company are bound to reap substantial benefits. No intelligent foreman would object to hiring a dictator of this type.

Robert S. Alexander
Greenville, R. I.

•

No foreman should claim the authority of an absolute dictator; however he should have the last word and be willing and free to hear from any

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source that may offer a plan that seems reasonable.

The man that has previously been repairing a machine and evidently is capable of judging what the machine needs, at a time when there is a chance for a general overhauling to fit it for use on a specially urgent and important job that is coming in. It would seem the logical thing for the foreman to consult and if possible use such a man to do the overhauling, even though his conclusions did not agree exactly with the foreman who undoubtedly had never taken the machine all apart for examination of the worn and damaged parts

It takes experience similar to this case which is cited to keep the machine up to date. In fact such cases give him the experience needed to improve in craftsmanship.

It is the results obtained in the long run that makes a foreman valuable. It is to be expected that he should make some explanations for his reasons for not always handling a job just as a higher up man might suggest, but it has been my experience that a foreman to get best results does not have to emphasize by either words or actions to show that he is the foreman. A humble disposition in all of his dealings counts most. Results are what count in the final reckoning.

However, it was quite right that the foreman be told of the urgency in this case, requiring a shortened repair time. He should give very careful thought to the matter before making his decision, making sure that the delay, due to the longer time required to make a first-class repair, would in the long run be of benefit to the organization.

H. B. Martin
Watervliet, N. Y.

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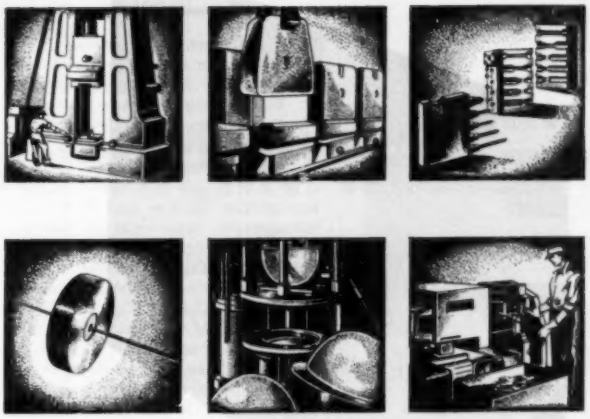

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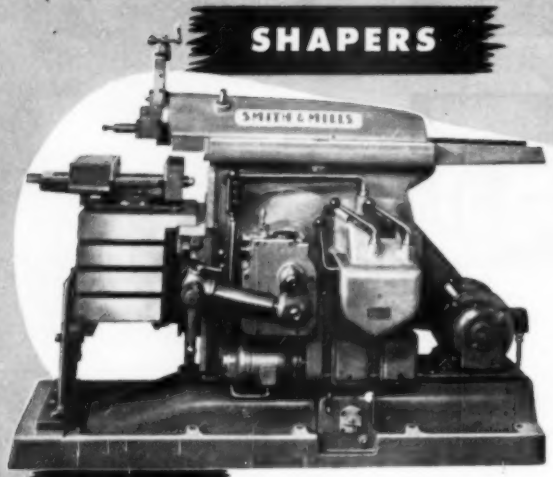

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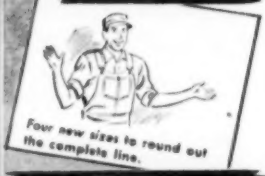

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NEW BOOKS

THE STATUS OF THE FOREMAN. *Conclusions of a study group of British Senior Executives. Published by the Industrial Administration Group, Birmingham Central Technical College, Birmingham, England. 19 pages. Price $0.50.*

Recognition of the fact that good management must exist on the factory floor where production takes place is creating an increasing interest in improving the position of the foreman in industry. Thus, this booklet, presenting the conclusions of a group of high-ranking British executives, who have studied the foreman problem, contains many ideas and suggestions that will be of interest to American management. The analysis is on a high plane and is specific in its information content.

Defining what is meant by foremanship from the point of view of responsibility, the booklet covers the selection and training of foremen, the problems created by staff organization and the assigning of functions to specialists, the personal relationship of the foreman with unions, informational procedures, and remuneration.

•

TRANSMITTING INFORMATION THROUGH MANAGEMENT AND UNION CHANNELS—TWO CASE STUDIES. *By Helen Baker, associate director; John W. Ballantine and John M. True, formerly research assistants. Industrial Relations Section, Princeton University, Princeton, N. J. 140 pages. Paper bound, $2.50, cloth bound, $3.00.*

The growing realization of the vital nature of communications in obtaining swift, coordinated action and in developing constructive labor relations in an industrial organization makes this report of significant interest. The companies and unions studies are: Johnson & Johnson and the Textile Workers Union of America; Esso Standard Oil Co. and the Independent Petroleum Workers. The presentation is a scholarly, thorough analysis of the informational activities of each group. It starts with the background of the company and the union; works through their objectives in transmitting information and the methods for meeting

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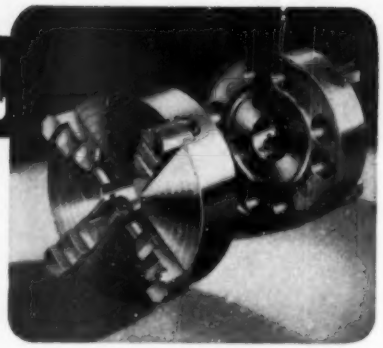

Models for medium and heavy duty tool room and general machine shop work. Available in sizes from 4½" to 36" with semi-steel, steel, or forged steel bodies. All other parts are heat-treated alloy steel. Jaws are solid reversible or two-piece with reversible tops for either internal or external gripping. The body surrounds more than 60% of each operating screw for the full length of the screw to assure proper alignment at all times.

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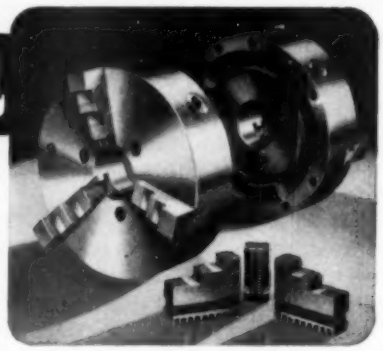

Self-centering models for light, medium and heavy duty jobs in tool room or for production runs. Available in sizes from 3" to 21" with semi-steel or forged steel bodies, and heat-treated alloy steel for all other parts. Provided with two sets of solid jaws or two-piece jaws for holding internal or external work. Lands on the jaw, jaw steps and end bites are ground after the chuck is assembled.

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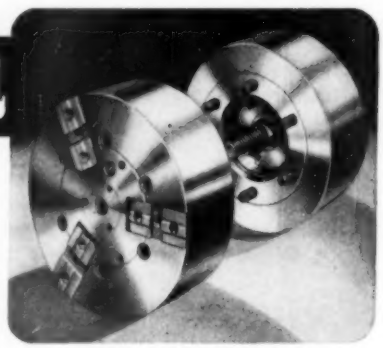

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them; and covers employee attitudes, media, adequacy of information, and the possibilities of common action on informational programs. The second case is approached in similar manner. Those who are responsible for policy in this phase of management will find considerable valuable information in this report.

•

THE SUPERVISOR'S MANAGEMENT GUIDE. *Edited by M. Joseph Dooker and Vivienne Marquis. Published by the American Management Association, 330 West 42nd St., New York 18, N.Y. 189 pages, ring-bound. Price to AMA members $3.00, non-members, $3.50.*

This handbook is intended as a guide for supervisors and foremen in applying methods for improving human relations in industry. It can be used for individual reading, as a desk manual for operating executives, and for supervising conference training through chapter-by-chapter discussion.

Material presented includes: the principles of sound human relations; supervisory attitudes and practices, and their effect on worker morale and productivity; qualities of leadership; the art of speaking effectively to employees; tests for determining competent supervisors and executives; getting results from conference training; management policy and goals. Case histories and discussions of successful programs and techniques are presented. Twenty chapters, written by 17 executives, are included.

•

TECHNIQUES IN PLANT LAYOUT. *By James M. Apple, associate professor of mechanical engineering, Michigan State College, East Lansing. 66 pages.*

Starting with the background from which a layout problem stems, this book in the first chapter presents the major objectives in plant layout, briefly points out the importance of each, and indicates in condensed fashion the methods by which they are attained. A following chapter then gives an excellent list of the factors that must be considered to meet the layout objectives and discusses the effect of each factor on the layout problem. The text next proceeds to the steps in layout planning and develops the details under the headings: planning the layout; flow

of materials; materials handling; operation planning; layout planning; flow planning; the master layout; checking the layout. The scope and organization of the layout department and its relationship to other departments is also discussed.

The book is very well organized and easy to follow. In each chapter, main points are outlined initially, then developed in detail; and the entire text is a logical progression through the layout procedure. Numerous line drawings of various arrangements are included.

•

DEFORMATION OF METALS AS RELATED TO FORMING AND SERVICE. *Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 126 pages. Price $2.*

Technical Publication No. 87 includes technical papers on measurement of ductility in sheet metals and hydraulic bulge testing of sheet metals.

The first paper discusses the relationship of measurement of uniform elongation and reduction in area of aluminum alloys with respect to ductility and forming limits in stretching and bending.

The second paper reports findings with a circular and an elliptical bulge test so that conclusions may be drawn concerning behavior of material under combined stresses, which prevail in practical sheet-metal forming.

•

PROCEEDINGS OF THE PERSONNEL AND INDUSTRIAL RELATIONS CONFERENCE AT PURDUE UNIVERSITY. *Bulletin No. 67. By F. Lynn Cason. Purdue University, Lafayette, Ind. 27 pages. Free.*

This booklet briefs three addresses: Current Labor Legislation; Value and Structure of the Personnel Department; Human Relations—the Art of Togetherness. It also lists the conference program and register, officers and constitution of the Indiana Personnel Association, and other extension publications.

•

EXPERIMENTS ON BELT-DRIVE FUNDAMENTALS. *By C. A. Norman. Bulletin No. 135. College of Engineering, Ohio State University, Columbus, Ohio. 36 pages. Price $1.*

Results are given and the experimental procedure is described in this booklet reporting on tests that in-

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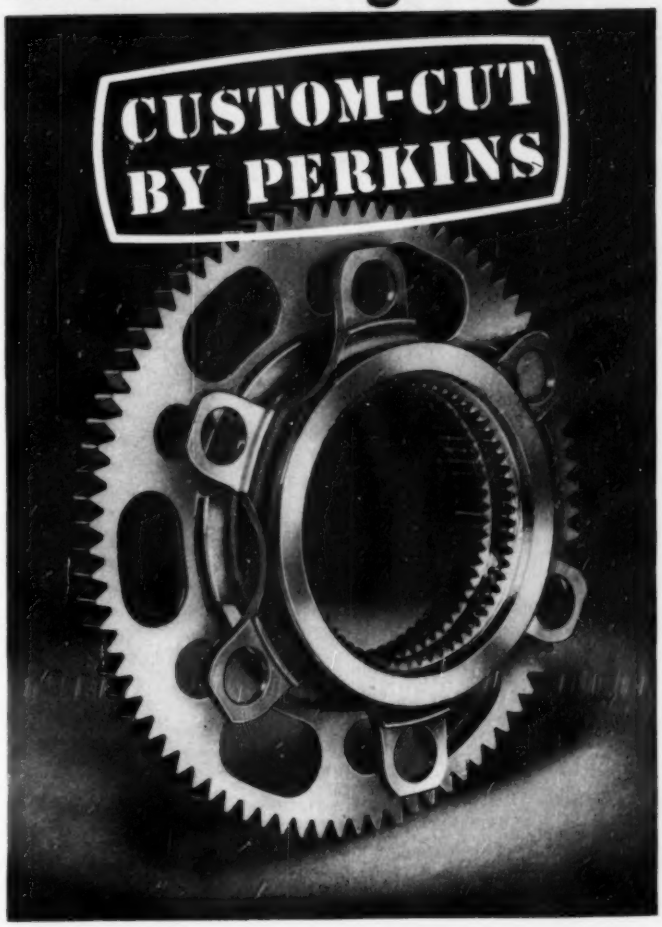

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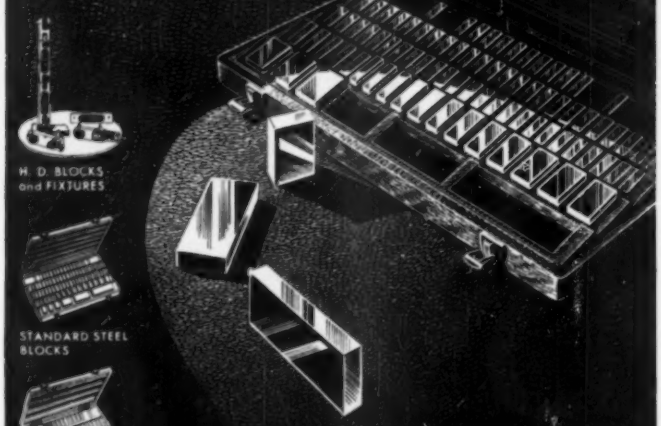

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12 POINTERS THAT LEAD TO PROMOTION. *By Richard H. Moulton. Published by The Updegraff Press Ltd., Scarsdale, N. Y. 16 pages. Price $0.30 per single copy (less in quantity).*

This pamphlet gives a dozen rules for a man, who seeks advancement, to improve his relationships with his superiors. Written in short, easily read style, its points are clearly made.

•

A TRADE UNION LIBRARY *1949. Fifth Edition. By Hazel C. Benjamin, librarian, Industrial Relations Section, Princeton University, Princeton, N.J. 54 pages. Price $0.75.*

A general, selected bibliography for all concerned with labor relations. The list is classified under headings such as: trade union structure, policies, and programs; personnel problems and programs; government and labor. More than 200 books are included and a brief description of the nature of each book is given.

•

JIGS, TOOLS, AND FIXTURES—*Fourth Edition Revised. By Philip Gates, production engineer. The Technical Press Limited, Gloucester Road, Kingston Hill, Surrey, London. Price 17 shillings, 6 pence. 209 pages.*

A book that describes in a simple, direct manner the design of the majority of basic jigs, fixtures, cutters, and holders commonly found on modern machine tools, this text is most valuable to the student or beginner in the shop or tool design department. Following chapters on drawing practice, sketching, and design considerations, the author covers drill jigs, milling fixtures, turning equipment, cutters, and threading tools. One chapter also is devoted to each of the following subjects: press tools, gages, materials, mag-

netic and pneumatic gripping, standardization, jig and tool office procedure, and special equipment. The section on drawing practice is based on proposals of the British Standards Institute and is the only change from the previous edition. The majority of illustrations are of British equipment.

•

CONVEYORS AND RELATED EQUIPMENT, *Second Edition. By Wilbur G. Hudson, M.E. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Price $7.00. 468 pages.*

Although its title is all-inclusive, this book deals primarily with the science of handling bulk materials. Equipment described includes screw, belt, flight and apron, pneumatic, and hydraulic conveyors; bucket elevators and carriers; skip hoists; aerial tramways; bins and bunkers; car unloaders; power-plant coal and ash handling; and related units.

In this second edition, information has been added on industrial trucks, tractors, and trailers; on pneumatic conveying; on dust explosion hazards in industrial installations; and on technological improvements in belts, chains, and other components. As the author presents considerable engineering information on the application and limitations of equipment previously mentioned, the book should be of particular value to the student, consultant, or plant engineer faced with bulk-handling problems.

•

IMPROVING STANDARDS OF MANAGEMENT AT PRODUCTIVE LEVELS. *A 24-page booklet reporting a discussion led by G. Chelioti, a director of General Electric Co., Ltd. Published by the Industrial Administration Group, Birmingham Central Technical College, Suffolk St., Birmingham. Price 2 shillings.*

Here is a stimulating discussion of the job of management with particular reference to qualifications required at the foreman level. The training needs of foremen and the question of selection of men for foremanship are stressed in particular.

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PACKAGING, MARKING, AND LOADING METHODS FOR STEEL PRODUCTS FOR COMMERCIAL OVERSEAS SHIPMENTS. *Simplified Practice Recommendation R-237-49. U. S. Dept. of Commerce. For sale by supt. of documents. U. S. Gov't Printing Office, Washington 25, D.C. 165 pages. Price $0.40.*

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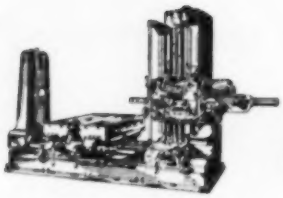

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2 DRILLING, TAPPING UNITS—*The Geometric Co., 1931 Antoinette, Detroit 8, Mich.* 8-page illustrated catalog covers line of automatic drilling and tapping units. Applications are demonstrated and engineering drawings are included.

3 ENGRAVERS—*Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass.* 8-page bulletin introduces the Mico two- and three-dimensional engraver, lists specifications, and illustrates and describes key parts of the unit.

4 PRESSROOM EQUIPMENT—*U. S. Tool Co., Inc., Ampere (East Orange), N.J.* 13-page bulletin No. 70 covers slide feeds, stock straighteners, roll feeds, stock oilers and wipers, plain and automatic stock reels, coil cradles, and combination coil cradle and straightener. Specifications, illustrations, and descriptions are presented.

5 MILLING MACHINES—*The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* 35-page illustrated booklet provides detailed specifications of plain and duplex hydromatic milling machines. Units are built in 18 sizes with from 24- to 90-in. table travel.

6 HYDRAULIC PRESS—*The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* 4-page bulletin 4062 presents a two-way all-hydraulic straightening press, for straightening structural shapes, weldments, forgings, castings, and plates. Illustrations and specifications are included.

7 MACHINE TOOLS—*Miles Machinery Co., Saginaw, Mich.* 24-page catalog lists over 500 pieces of new, rebuilt, and used machine tools. Several pages are devoted to illustrations of the company's warehouses and repair shops.

8 HYDRAULIC PRESSES—*Elmes Engineering Division of American Steel Foundries, Cincinnati 29, Ohio.* 12-page bulletin 1010-B covers hydraulic metal working presses. Electric control gives semi-automatic operation, automatic operation, and inching with speed change and reversal of slide governed either by ram travel or pressure.

9 METAL FORMING MACHINES—*The Cyril Bath Co., 6737 Machinery Ave., Cleveland 3, Ohio.* 12-page catalog C700 illustrates and describes a wide variety of metal forming machines and prose-brake dies. Machines covered are for production of metal cabinets, cases, housings, liners, refrigerators, washing machines, vending machines, electric controls, kitchen cabinets, and similar units.

10 GEAR SHAVING—*National Broach and Machine Co., 5600 St. Jean, Detroit 13, Mich.* 16-page booklet treats the essentials of rotary gear shaving including basic principles, elements of shaving machine operation, cutter characteristics and action, the relationship between cutting and guiding action, and the cross axes principle.

11 GRINDERS—*Gardner Machine Co., Beloit, Wis.* 17-page bulletin 11-8 illustrates, describes, and gives specifications of line of single spindle grinders. 16-page Bulletin No. 12-7 covers double spindle grinders and 8-page bulletin 13-7, horizontal disk grinders.

12 LATHE CHUCK—*The Jacobs Mfg. Co., West Hartford 10, Conn.* 7-page illustrated bulletin 49-LC presents a spindle-nose lathe chuck and the variable-size rubber-flex collet. Cutaway drawings, engineering drawings, dimensions, and a price list are included.

TOOLS AND ACCESSORIES

13 AIR TOOLS—*Chicago Pneumatic Tool Co., 6 East 44th St., New York 17, N.Y.* 146-page catalog No. 564 lists, illustrates, and gives engineering data on impact wrenches, screw drivers and nut runners, drills, abrasive tools, riveters, hammers, hoists, winches and balancers, air motors, and other company products.

14 PORTABLE TOOLS—*Rotor Tool Co., 17325 Euclid Ave., Cleveland 12, Ohio.* 23-page reprint from AMERICAN MACHINIST is a condensation of a series of seven articles on "How to Choose and Use Portable Tools."

15 MARKING TOOLS—*Geo. T. Schmidt, Inc., 4100 Ravenswood Ave., Chicago 13, Ill.* 15-page catalog illustrates and describes 18 marking tools and 19 pieces of marking machinery. Included are samples of marking done by this equipment.

16 TAPS—*Threadwell Tap & Die Co., Greenfield, Mass.* 9-page net price list of standard taps contains no advertising and is available to all users and distributors of taps regardless of make.

17 BROACHES—*Kaas Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Multi-colored, illustrated catalog describes the complete line of Glenny push broaches and eccentric adapters. It provides operating and engineering data, specifications and prices.

18 OPTICS—*Wilo Inc., 145 Broadway, New York 6, N.Y.* 12-page Bulletin 949 presents a detailed illustrated description of the Ak-1 Akrometer which is said to solve many measuring problems in high precision mechanical workshops. Among other things the unit measures angles, plane surfaces, prisms and checks machines carriages and guides axes of lathes and squareness of tool machine details.

19 HARDNESS TESTER—*Kent Ckf Laboratories, Peekskill, N.Y.* 4-page bulletin K-49 provides a comprehensive discussion of the Kentron micro-hardness tester. The material is broken down into discussions of the extended range, mechanical stage, microscope, Knoop indenter, 136° diamond-pyramid indenter, and surface preparation.

20 FLEXIBLE SHAFT EQUIPMENT—*R. G. Haskins Co., 2651 W. Harrison St., Chicago 12, Ill.* 8-page folder illustrates, describes, and demonstrates uses of flexible shaft equipment. Sanding, grinding, rotary filing, rubbing, polishing, and wire-brushing heads are pictured and specifications for the flexible shaft machinery are given.

21 TWIST DRILL—*Union Twist Drill Co., Athol, Mass.* 12-page consumer net price list includes taper-shank, straight-shank, bit-stock, Prentice, Cone, and ratchet drills. Prices for both the carbon-steel and high-speed-steel tools are given.

22 HEAT TREATING AND WELDING—*Hauch Mfg. Co., 134-136 Tenth St., Brooklyn 15, N.Y.* 24-page catalog 410 offers a detailed description, complete with cutaway drawings, performance charts, engineering drawings, and specifications of a proportioning oil burner for industrial process heating applications. Illustrations of 71 industrial applications are included.

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23 INDUCTION HEATING—*Ajax Electrothermic Corp., Ajax Park, Trenton 5, N.J.* 4-page pamphlet describes the principles and applications of the company's low-frequency induction heaters for autotempering, die massing, stress relieving, shrink fits, and other applications.

24 WELDERS — *The Taylor-Winfield Corp., Warren, Ohio.* 4-page bulletin 8-103 presents descriptions, schematic drawings, and illustrations of four multiple electrode welding machines: the Hydro-speed, Air-speed, Multi-speed and Ultra-speed units.

25 TILTING FURNACES—*Bellevue Industrial Furnace Co., 2971 Bellevue Ave., Detroit 7, Mich.* 4-page catalog describes a reverberatory tilting furnace for melting of non-ferrous metals, iron, ferro manganese, copper ferrite, and malleable iron. Units have capacities from 500 to 3000 lbs.

PLANT SERVICE EQUIPMENT

26 FREIGHT ELEVATORS — *Elevator Division, Westinghouse Electric Corp., Jersey City, N. J.* 44-page buyer's guide offers performance charts and data, descriptions, and illustrations of applications of a wide variety of freight elevators.

27 LIFT TRUCKS—*Hyster Co., Portland 8, Ore.* 28-page catalog covers attachments, tools, and accessories for lift trucks, Karry Kranes, and straddle trucks. Applications of various units are illustrated.

28 MATERIALS HANDLING — *Lyon-Raymond Corp., 4762 Madison St., Greene, N. Y.* 16-page booklet shows how proper positioning of materials saves unnecessary handling during production operations. It contains illustrations and descriptions of twelve different types of positioning equipment.

29 LIGHTING—*General Lighting Co., 1527 Charlotte St., New York 60, N. Y.* 8-page catalog 649 shows the many standard forms and uses of this company's "Accentlights." The units feature absolute flexibility of application, varying mounting arrangements, and adaptability to accent or over-all lighting.

30 CHRONOGRAPHS — *The Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.* 16-page bulletin 171-49 describes and illustrates tape chronographs, drum chronographs, electrically-driven tuning forks, regulator clocks, and accessories.

31 CONVEYORS—*Triangle Equipment Co. Inc., 45 River Road, Nutley, N. J.* 8-page bulletin No. B8 covers overhead and gravity conveyors, load totors and boosters, and a freight ladder. Applications are shown and capacities are given.

32 STEEL DRAWERS—*Red Tiger Products Inc., 20 N. Wacker Drive, Chicago 6, Ill.* 8-page catalog No. 110 shows a wide variety of steel drawers, shelves, bins, and other storage equipment for manufacturing plants, institutions, shops, maintenance departments, and warehouses.

33 FORK TRUCKS — *Lewis-Shepard Products, Inc., 764 Walnut St., Watertown 72, Mass.* 16-page bulletin No. 25 covers a complete line of electric fork trucks and provides specifications and dimensional drawings of each model.

PARTS AND MATERIALS

34 STEEL—*Precision Steel Warehouse, Inc., 4425 West Kinzie St., Chicago 24, Ill.* 96-page catalog No. 50 gives complete specifications on all Precision Brand steel products and serves as a handy reference guide for steel purchasing agents, production executives, foremen, and engineers. Extra features include AISI and SAE steel analyses, a glossary of trade terms, and decimal equivalent tables.

35 LUBRICANTS—*Keystone Lubricating Co., 21st and Lippincott Sts., Philadelphia, Pa.* 30-page catalog C 10L presents a wide line of specialized lubricants for industrial and automotive machinery. Test recommendations for lubricating all types of bearings under varying operating conditions are given.

36 ELECTRONIC CONTROLS—*Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.* 62-page booklet entitled "Cutting Production Costs with Electronic Controls" presents 45 case studies, each describing an industrial control problem which has been solved by the use of electronics.

37 SPROCKETS AND ROLLER CHAINS—*Diamond Chain Co. Inc., Indianapolis 7, Ind.* 80-page catalog No. 819 presents complete specifications and prices, including speed ratios, for various sprocket combinations available with the company's wide selection of made-to-order sprockets and roller chains. Types of sprockets are illustrated and described at the beginning of the book.

38 HYDRAULIC CYLINDERS—*Hydro-Line Mfg. Co., 711-19 St., Rockford, Ill.* 32-page catalog contains complete engineering data for a line of both high- and low-pressure hydraulic cylinders and air cylinders. Units are available for operating pressures to 1500 psi.

39 DRAWING COMPOUNDS — *Esso Standard Oil Co., 15 W. 51st St., New York 19, N. Y.* 12-page booklet D 229-IE entitled "Drawing Compounds for Metals" contains detailed recommendations for selecting drawing compounds for use on various ferrous and non-ferrous metals in stampings, forming, wire-drawing, tube-drawing, tube-bending, stretch forming, and hot tube bending, extrusion, and forging.

40 BRAKES AND CLUTCHES—*Warner Electric Brake & Mfg. Co., Beloit, Wis.* 24-page bulletin No. 701 includes detailed drawings and photographs of ICB clutch and brake units for industrial machinery and electro-motor applications. It is a combination engineering catalog and reference book containing the necessary information for computing clutch and brake torques.

41 ROLLER BEARINGS—*Timken Roller Bearing Co., Canton 6, Ohio.* 36-page pocket-size booklet entitled "Timken Products" gives a comprehensive discussion of what Timken's roller bearings are, and how they carry thrust and radio loads. Types of bearings and their applications are given.

42 CUTTING FLUIDS—*D. A. Stuart Oil Co. Ltd., 2727 South Troy St., Chicago 23, Ill.* 72-page pocket-size booklet provides a comprehensive report on all phases of cutting fluids including research, recutting fluids, and their application. It presents 10 rules for prolonging tool life and insuring maximum production efficiency.

43 FLEXIBLE-SHAFT MACHINES—*Wyandotch & Stauf, Inc., 836-850 W. Hubbard St., Chicago.* 15-page catalog No. 50 presents a line of flexible shaft machinery and component parts including a wide variety of grinding wheels, cutters, brushes, arbors, and buff wheels.

44 BEARINGS AND CASTINGS—*Advertising Dept., National Bearing Div., American Brake Shoe Co., 4930 Manchester Ave., St. Louis 10, Mo.* 28-page booklet, illustrated with pictures and charts, gives physical properties and comparative specifications for 25 different bronze alloys and five aluminum and magnesium bronzes. Sizes and weights of rough and machined "Tiger" bronze bars are tabulated.

45 MACHINE & TOOL ACCESSORIES — *George P. Bub & Son, 6011 Bradley Ave., Cleveland 9, Ohio.* 11-page catalog 50 provides complete dimensions for cast iron hand knobs, hand wheels, spherical washers, balance cranks, clamping levers, and other machine and tool accessories.

MISCELLANEOUS

46 INJECTION MOLDING—*Tennessee Eastman Corp. Kingsport, Tenn.* 55-page book entitled "Tenite Injection Molding," is a procedural guide to molding of Tenite I and Tenite II cellulose acetate and cellulose acetate butyrate thermoplastics. It contains detailed data on choice of material, prorer production design, injection molding machines, mold design and construction, and various finishing operations.

47 POWDER METALLURGY—*F. J. Stokes Machine Co., Philadelphia, Pa.* 26-page manila-bound book called "Powder Metallurgy Today" provides a brief summary of the present status of powder metallurgy as a modern production method. It suggests future possibilities in the powder metallurgy field and takes note of things not now feasible.

48 JOBBING—*Hardinge Mfg. Co., 240 Art St., York, Pa.* 12-page bulletin AS-400 describes made-to-order job plant facilities in detail and gives information regarding types of patterns, castings, machine work, and plate steel work which are handled, as well as numerous examples of custom-built machinery.

49 BLAST CLEANING — *American Wheelabrator and Equipment Corp., Mishawaka, Ind.* 24-page catalog 74A covers the line of Wheelabrator airless centrifugal blast-cleaning units. Illustrations of various units in operation are provided and examples of finished work are shown.

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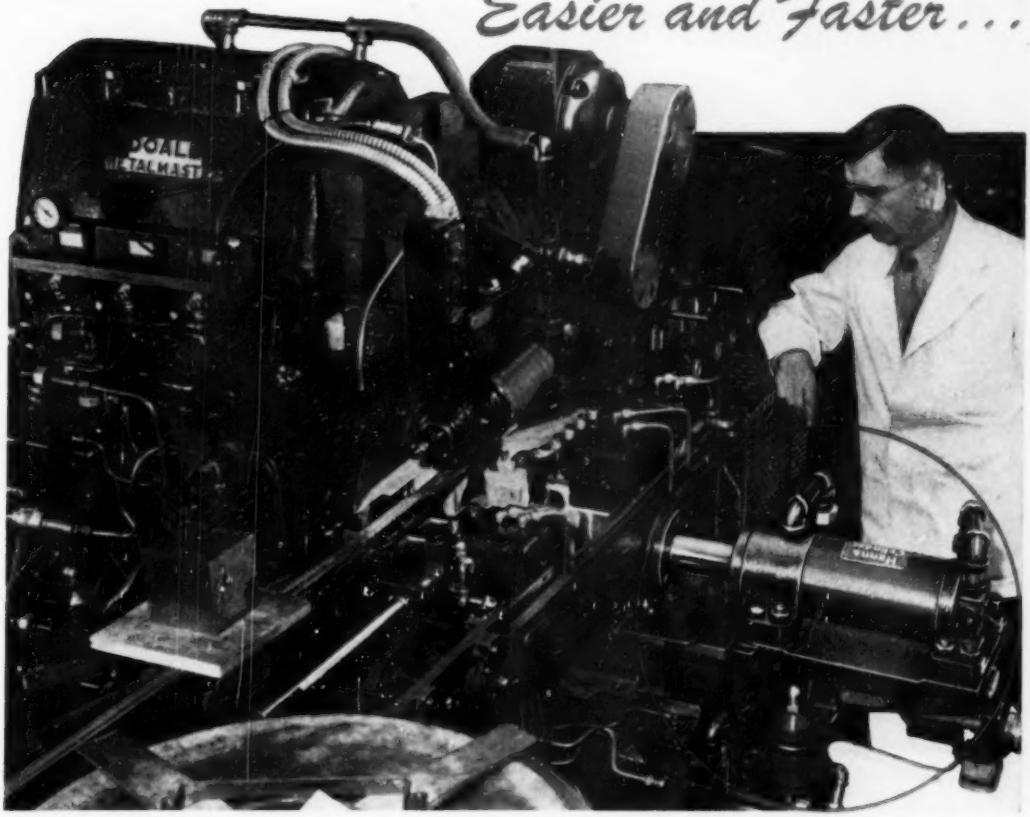

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IN THIS unique machine, specially designed by The DoAll Company for automatic tooth-cutting of saw bands, Hanna Hydraulic Cylinder Power plays an important part. The High-Pressure Cylinder feeds steel strips into the milling cutters (where 40 bands may be milled simultaneously) with smooth, dependable precision.

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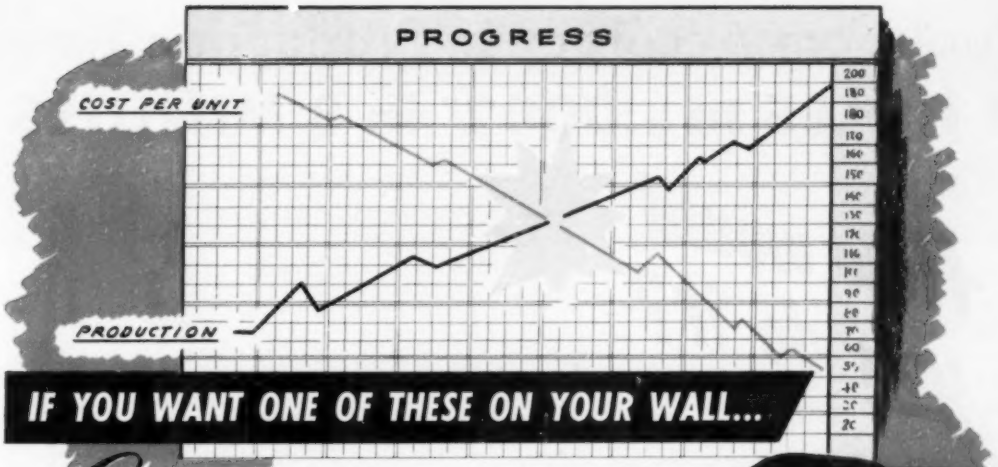

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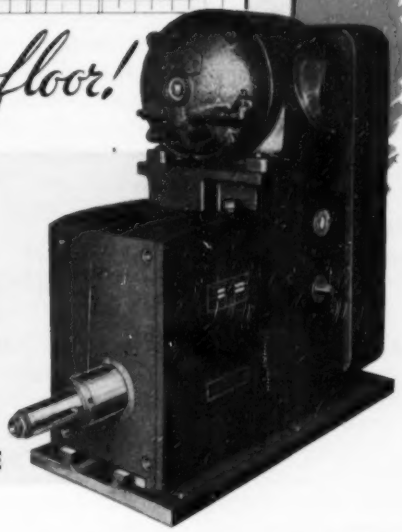

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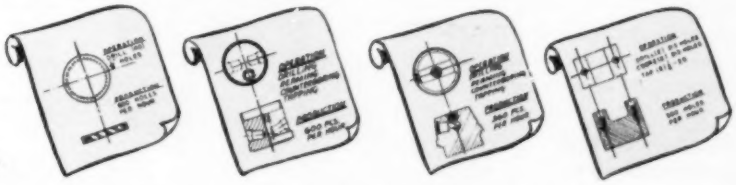

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4 HOLES to ±.0002" in 8 MINUTES

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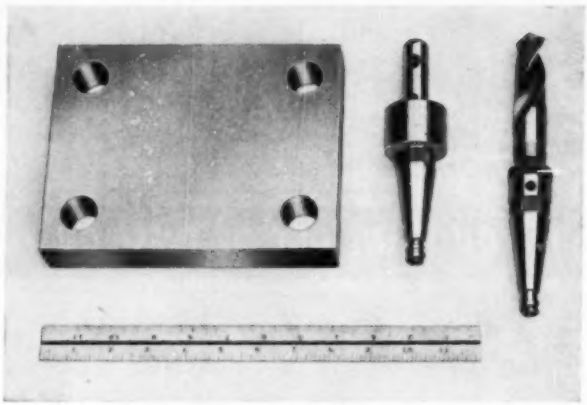

The only tools used to complete this Jig Borer production job were the drill and carbide bit. The carbide bit will hold size for four holes. The last hole is measured and the tool bit set for the next piece.

Sixteen of these pieces were needed. The four 1" holes are 1⅝" deep—with location and size tolerances ±.0002". It would be impossible to obtain such accuracy using a drill jig—and impractical on this short run. Then how could you locate, drill, bore and check the four holes in only 8 minutes?

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Using a No. 2 Moore Jig Borer with one 31/32" drill and one cut carbide bit, all sixteen pieces (64 holes) were finished in 2 hours and 38 minutes!

FIVE SIMPLE STEPS:

1. Load piece (no fixture needed)	30 sec.
2. Locate and drill 4 holes with 31/32" drill at 800 RPM	240 sec.
3. Bore holes with carbide bit at 1600 RPM	120 sec.
4. Check last hole and reset bit for next piece	60 sec.
5. Unload	30 sec.
Total time per piece	480 sec. or 8 min.
Total for 16 pieces (including 30 min. set-up time)	2 hrs. 38 min.

Why make a costly drill jig for those short production runs—or worry about keeping work within close tolerances? The Moore Jig Borer is a necessity in the toolroom; let it help you on tough production jobs, too. We have case histories which we will be glad to send you. Write today.

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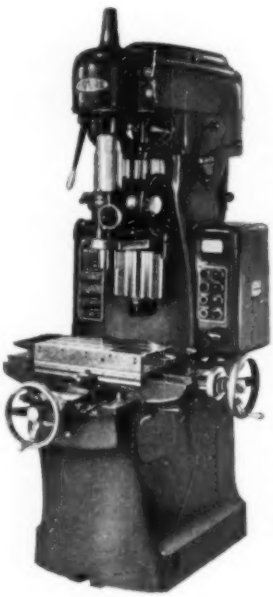
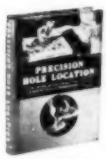


Rapid tool settings within .0001" by means of lead screws accurate to .0002" in 16"; infinitely variable, push-button controlled spindle speeds, quick tool changing and easily read scales and dials make the Moore Jig Borer the ideal machine for speed and accuracy—in the toolroom or on the production line.

HAVE YOU BOUGHT YOUR COPY OF "PRECISION HOLE LOCATION"?



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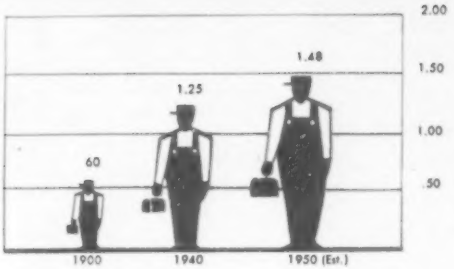
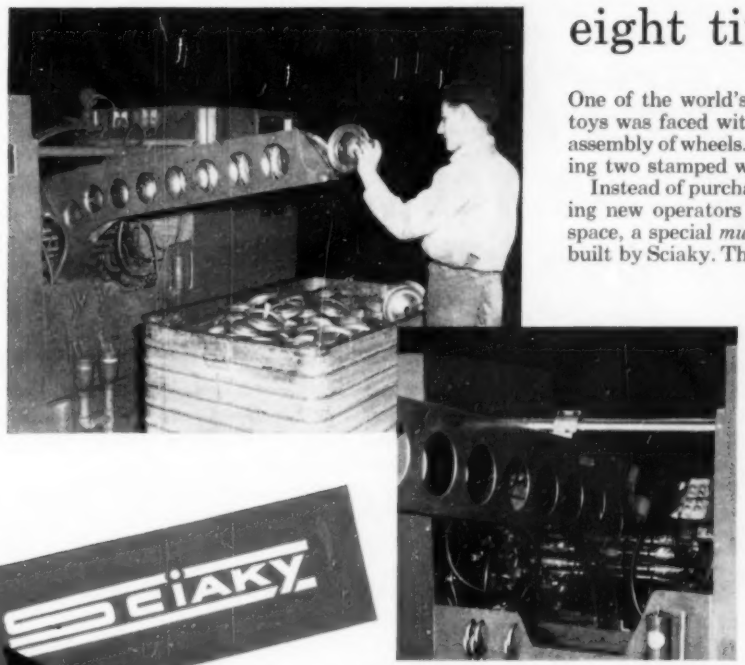


The basis of our well-being has always been closely allied with the *value of goods an hour's work will buy*. As the chart shows, this value has increased from 60c worth of goods in 1900 (at today's prices) to an estimated $1.48 worth in 1950. This value is bound to increase, and smart manufacturers know that *their* prosperity as well as the country's, depends upon their ability to produce more goods per man-hour expended.

here's how one manufacturer boosted production per man-hour eight times!



One of the world's largest producers of wheeled toys was faced with the problem of speeding up assembly of wheels. The assembly involved fastening two stamped wheel halves with 8 spot welds.

Instead of purchasing additional welders, training new operators and taking up valuable floor space, a special *multiple welder* was designed and built by Sciaky. The operator has only to load the gravity feed chute, press starting switch and then keep chute full. Finished wheels drop out the other side at the rate of 30 per minute!

Thus, only one operator welds more than 8 times as many wheels as formerly produced. Here is an instance where skilled use of resistance welding greatly *increased production* and *decreased unit cost*. For a complete description of this machine write for Bulletin No. 25A.

SCIAKY

THREE-PHASE

Sciaky specializes in both a complete line of standard welders, and in the design and manufacture of special units, tailored to your needs. You are invited to consult our Application Department without obligation.

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For greater flexibility and quick tooling set-up.

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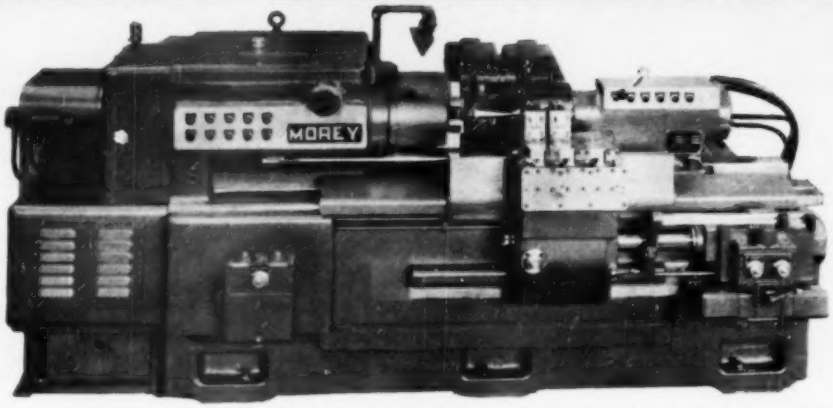
Increases tool life and maintains close tolerances.



These rigid and powerful machines turn rough forgings to the finished size in one chucking, maintaining tolerances of .001", and using tungsten-carbide tools the way they should be used. Let us show you how these lathes pay for themselves in an amazingly short period, and write for full details to

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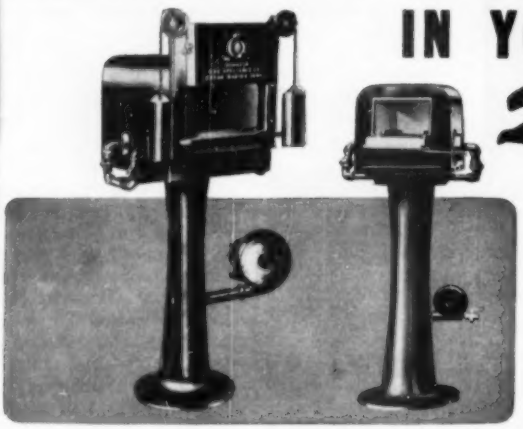

Heat treat high speed steels, harden high carbon steels, braze carbide tipped tools in your own plant. Save time and gas with *Quick Acting* JOHNSON Hi-Speed Furnaces on the job.

Turn on the heat and they're ready for action to produce high uniform temperatures FAST at low fuel cost. Temperatures are easily regulated with accuracy.

Install *Quick Acting* JOHNSON units in your plant now. Their low initial cost is soon paid for in increased plant efficiency and operating economy.

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Pot Hardening, Melting & Annealing Furnaces — Burners — Torches — Blowers — Mixers — Valves

Sixth in a series of Unusual Grinding Wheel Operations

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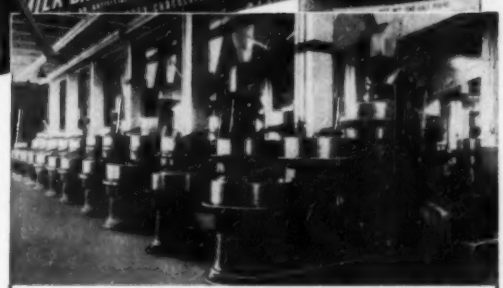
● The delicious chocolate flavor of Hershey's and other brands of chocolate, starts with the *grinding* of the dried cocoa beans. Pulverizing the bean by grinding, rather than by any other process, retains the original flavor.

Whatever YOUR grinding problem may be, BAY STATE can solve it . . . fast. Possibly the exact specifications to meet your requirements can be supplied directly from large stocks either in Westboro, branch warehouses, or from our distributors strategically located throughout the United States.

Send us your grinding problems. We can help you.



These mills, using fine, hard grinding wheels convert the dried cocoa beans into rich chocolate liquor. Courtesy of Hershey Chocolate Corporation

BAY STATE ABRASIVE PRODUCTS CO.
Westboro, Massachusetts, U. S. A.

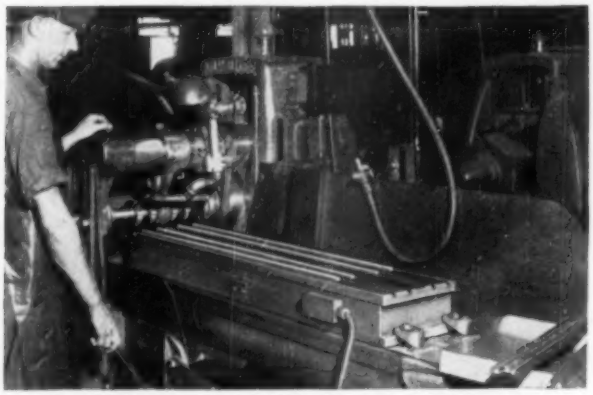
Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh.
Distributors — All principal Cities.

BAY STATE®

MEMBER OF THE GRINDING WHEEL INSTITUTE

Top Performance Consistently Duplicated

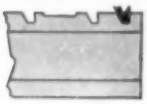
Tripled PRODUCTION . . .
That's What Remington Rand Did With MAGNA-LOCK Magnetic Chucks



JOB—mill clearance cut and 90° "V" cut on Carriage Rail Lower Race.

FORMER METHOD—climb milling (2 machines) two set-ups and two manually operated fixtures for each machine.		PRESENT METHOD—climb milling (2 machines) one set-up and one MAGNA-LOCK SUPREME 10" x 48" Magnetic Chuck* for each machine.	
Production	70 pieces per hour	Production	200 pieces per hour
Cost	$0.0241 each	Cost	$0.00812 each
Rejects	25%	Rejects	None
Total Scrap	6%	Total Scrap	0.2 of 1%

*PAID FOR BOTH CHUCKS IN 57 WORKING DAYS



Cross-section of chuck showing recessed top plate with work piece in position.

C. J. Beard, Methods Engineer, Remington Rand, Elmira, New York, says:
"We are so well satisfied with the results of this set-up that we are in the process of tooling-up new parts, using MAGNA-LOCK Magnetic Chucks."

Write for *complete* details . . . Dept. AM-10

HANCHETT Magna-Lock CORPORATION
Magnetic Chucks and Devices
BIG RAPIDS • MICHIGAN • U. S. A.

How To Work ALUMINUM and its ALLOYS

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Sheet-Working Methods • Casting & Forging
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MOST of the book consists of material that has appeared in *Product Engineering*—material the engineer will use right at the drafting board, for quick, ready aid in scores of practical design problems. Calculations, properties of materials, production factors of design, and similar material is well represented. Other chapters give a great many basic designs for fastenings, mechanisms, drives, controls, etc., readily adaptable to a wide number of applications. Over 500 illustrations, many of which are engineering drawings of design details, are included.

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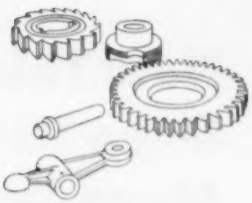

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V1 BOND

INTERNAL GRINDING WHEELS

A marked increase in efficiency in all types of internal grinding is provided by these new V1 Bond wheels. In a variety of materials and applications, the number of pieces per wheel have been substantially increased. A new process insures better duplication, better grinding action, and shorter delivery time. These wheels are equally efficient from starting diameter to minimum usable size. The Carborundum Company, Niagara Falls, New York.

CHECK THESE 5 POINTS

- **More pieces per wheel.**
- **Faster, freer, cooler cutting.**
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- **Greater range of work from one grade.**
- **Improved surface finishes and closer tolerances.**

Contact Carborundum's nearest office or distributor to avail yourself of these benefits.

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Now This Truck Does 10 Times More Work

In The DEMPSTER DUMPSTER SYSTEM

Picks-Up, Hauls, Dumps Four Railroad Cars of Materials Daily!

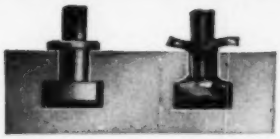
Before the Dempster-Dumpster Hoisting Unit was installed on the above truck chassis, it was one of 10 conventional trucks being loaded by hand. Now, the truck hoisting unit has replaced all 10 trucks. In many plants handling materials by the Dempster-Dumpster System, one Truck Hoisting Unit has replaced from 5 to 10 conventional trucks. In each plant a single hoisting unit handles many containers. In one particular installation, one unit serves 37 detachable containers of various types and sizes, ranging from 2½ to 8 cu. yds. This plant produces, daily, approximately 220 cu. yds. (about 4 car loads) of materials of every description, including rubbish, scrap and finished product. This daily output is handled in only eight hours by the Dempster-Dumpster equipment. Containers are spotted at materials' accumulation points throughout the plant. When each container is filled, it is picked up by the truck hoisting unit, carried to the point of disposal, set down intact or dumped and returned for refilling. The entire operation is hydraulically controlled and handled by only one man, the driver. This modern system is eliminating much equipment investment in industrial plants. It is cutting maintenance costs, tire and gas requirements. But, most important, it increases production with a minimum of manpower. Don't assume that your problem is different—that the Dempster-Dumpster System of materials handling is not applicable to your problem. Such cases have happened, only to discover later that this equipment was exactly the type needed. Our most difficult job in our advertising is to make the wide use . . . the flexibility and simplicity of the Dempster-Dumpster operation clear to the reader. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

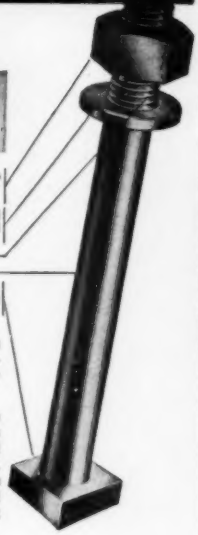
Pictured at left is a standard drop bottom type container in three stages of operation—on the ground, in carrying position, and dumping.

DEMPSTER BROTHERS

410 DEMPSTER BLDG., KNOXVILLE 17, TENN.

Protect this VITAL PART of Your Machines!





NUT of alloy steel, heat treated with Class 3 fit thread, and washer face commercially square with threads.

WASHER heat treated steel, chamfered edges. Ground to uniform thickness and hardened.

THREADS Class 3 fit.

SHANK ground for accuracy.

HEAD Machined square with shank. Square, flat surface of head fits machined surface of T-slot.

It is cheaper to use precision made bolts than to repair expensive machines. Poorly made bolts of soft steels can quickly ruin the accuracy of a machine.

Boyar-Schultz S. M. B. Bolts are made to protect the T-Slot. They are precision made from upset alloy steel forgings and threaded for a Class 3 fit. Use S. M. B. Nuts and Washers with S. M. B Bolts for firm, delicate adjustments. They hold work in exact position for heaviest machine cuts.

BOYAR-SCHULTZ

COPPER HEAD LAPS . . .

Economy and accuracy are the outstanding features of Copper Head Laps. They work rapidly. Only the replaceable copper sleeves wear out. Sleeve adjustment permits maintaining correct lapping size till worn out when it is replaced with a new one. Save costly tool room time. Available from stock in standard sizes, $\frac{1}{8}$" to $2\frac{1}{2}$" Diameters.

BOYAR-SCHULTZ CORPORATION

When you need the right gear *in a hurry*

It's one thing to get a gear cut exactly to your specifications . . . and another to get it *on time.* To be sure of satisfaction *both* ways, there's only one safe thing to do: specify Grant gears. For, whether you order by 'phone, telegraph or letter, Grant will have just the gear you want on its way in a matter of hours.

Next time a gear breakdown threatens a costly production tie-up, remember Grant's "in-the-pinch" service. Send today for free catalog of "In Stock" gears.

Reduction Units?
Grant has all types.
Write for catalog.

GRANT GEAR WORKS, INC.
169 W. SECOND STREET
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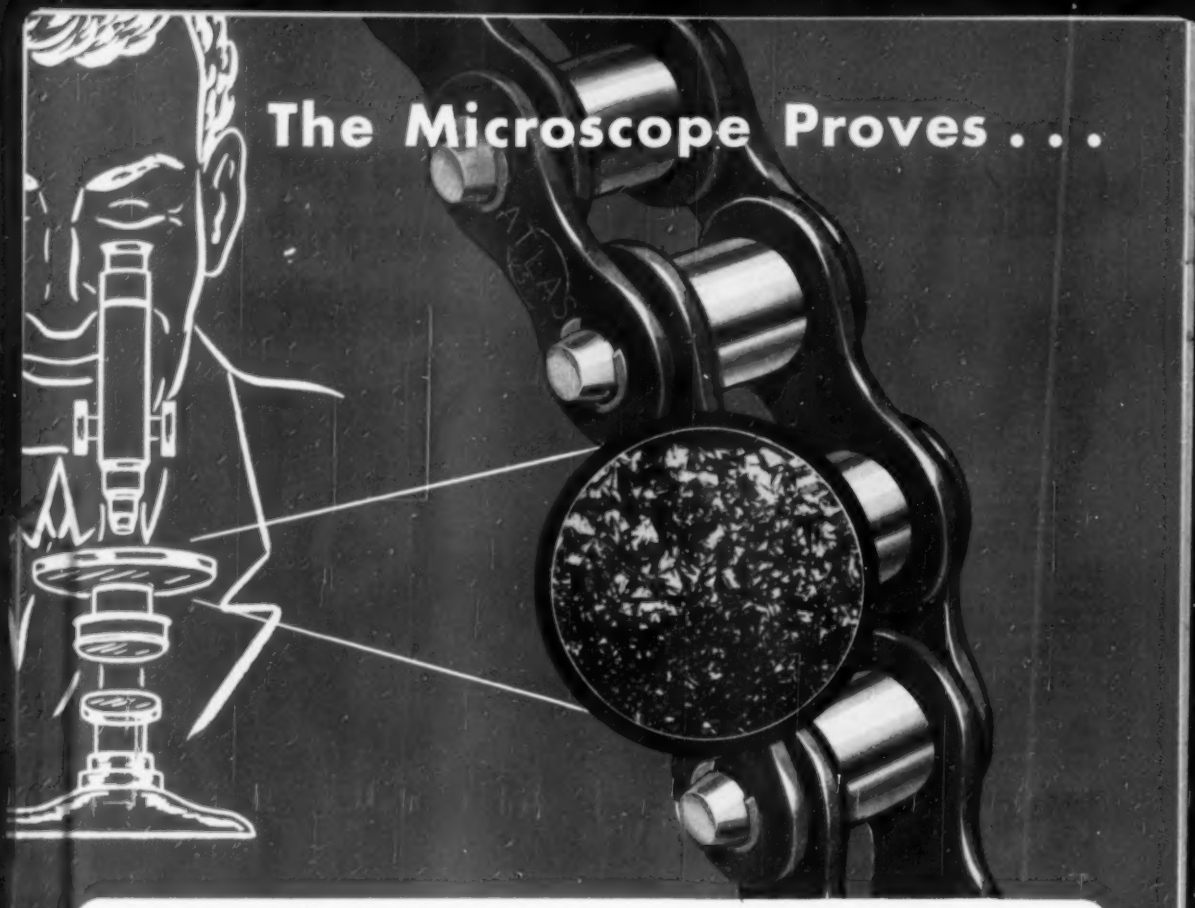
Grant FOR GEARS



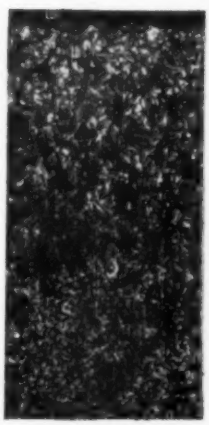
ATLAS CHAIN HAS LONGER LIFE!

Run roller chains through your hands and they all look alike. Put Atlas Chain under a microscope and you'll see the difference!

A metallographic microscope will reveal that all of the parts of Atlas Roller Chain are made of carefully selected steels . . . and scientifically heat treated for longer wear. Parts subject to excessive wear are treated to be tough by the special "Nicarb" Process. The effects of "Nicarbing" are revealed by the surface which combines the advantages of both carburizing and nitriding.

An outer rim of nitride needles knits together a base of carbide particles and binds them strongly to the core of steel. This nitride enriched outer surface, along with the binding qualities induced, proves by test to impart greater strength and wear resistance than conventional hardening. In addition, all parts take on an unusual resistance to corrosion and oxidation.

If you are interested in boosting the life of chain drives on your products or machines, take advantage of the longer life built into every link of Atlas Chain. Call in an Atlas representative for further details. Prices and specifications are available in our new catalog. Write for your free copy.



Conventional Hardening

ATLAS CHAIN & MANUFACTURING CO.

CASTOR & KENSINGTON AVENUES PHILADELPHIA 24, PENNA.

New Baush 2-Way Horizontal Unit drills, core drills, reams and taps 2 faces of 150 Header Castings, of various sizes, per hour.

SEQUENCE OF OPERATIONS USING 4-STATION TRUNNION TYPE HYDRAULIC INDEX FIXTURE:

1– Load and unload 1 part.

2– Left Head: Core drill holes for ½" pipe thread.
Right Head: Drill Holes for .514" ream.

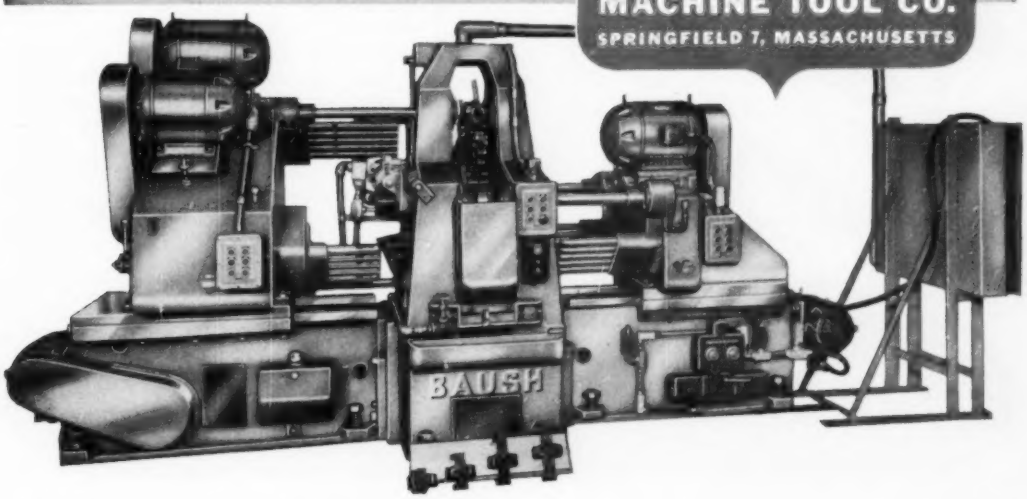
3– Left Head: Idle.
Right Head: Ream .514" diameter holes.

4– Left Head: Tap ½" pipe thread holes.
Right Head: Idle.

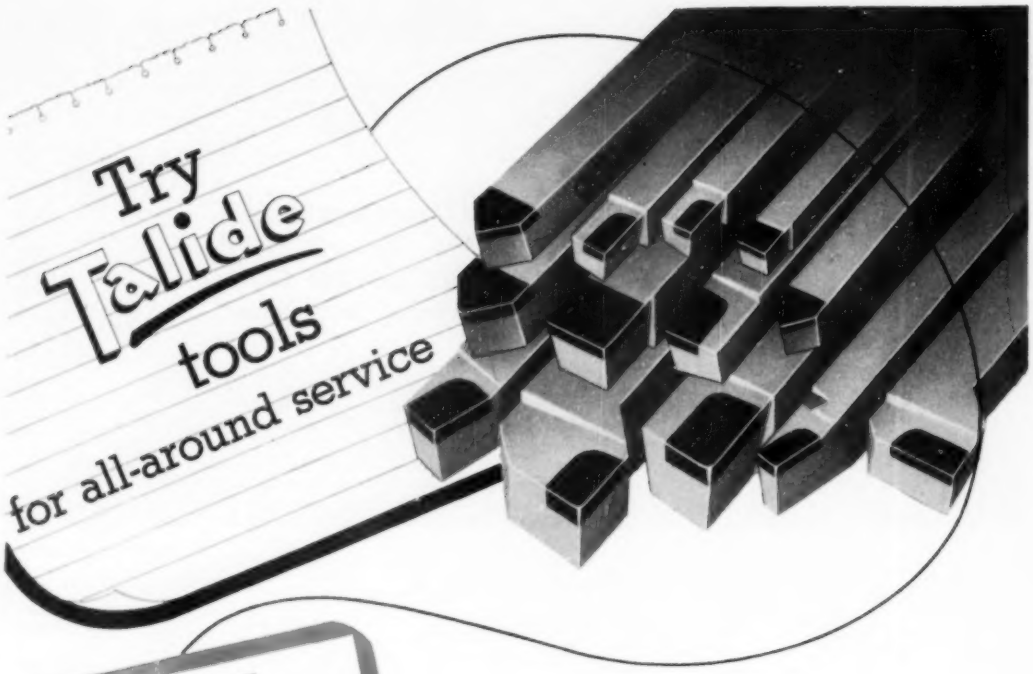
Fixture accommodates 4 sizes of header castings. Part is located from the rough contours of casting which is then clamped by hand. When index pin is positioned for final trunnion location, it interlocks with multiple heads to give automatic machining cycle.

Let Baush Engineers solve your production problems. Phone, wire or write us – Better still, send us your blueprints – we know we can help you.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS



Try Talide tools for all-around service



● How's your service on Carbide Tools and Tips? Such as advice or suggestions applying specifically to your machines and your requirements? The Talide salesman, who calls at your plant, is a qualified application engineer. He can roll up his sleeves and go to work.

How about fast service on Tools and Tips? There are Talide warehouses in Newark, N. J.; Youngstown, Ohio; Detroit, Mich.; and Chicago, Ill. You can have Talide Tools and Tips within 24 hours.

If you want specifications on grades and types, write for your engineering-style catalog 48-T on Standard Talide Tools and Tips.

Talide Carbide Tools cut and machine two to three times faster than any other metal. They stay sharp longer and take heavier cuts. Talide Tools eliminate most "down time" on turning, boring and facing operations.

Tie to Talide Tools and Tips for all-around service. Call our nearest application engineer or write to us at Youngstown and outline your problem.

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METAL CARBIDES CORPORATION

YOUNGSTOWN 5, OHIO *Pioneers in Tungsten Carbide Metallurgy*

CUTTING TOOLS · DRAWING DIES · WEAR RESISTANT PARTS

Makes everyone's job easier!

PARKER-KALON

SIZE-MARKED

Socket Head Cap Screws

Tool crib bosses

like 'em because the Size-Mark speeds up sorting of left-over, mixed screws, without the bother of "miking" or gauging.

Assembly workers

welcome them because the Size-Mark speeds the job. Sizes are always issued correctly — there's no time wasted, no annoyance.

Apprentices

are all for them because the Size-Mark saves time, protects "green hands" from errors, helps them learn faster.

and that GEAR GRIP† makes 'em slip-proof!

† U. S. DESIGN PAT. NO. 126,409

Even when fingers are oily, the GEAR GRIP on P-K* Socket Head Cap Screws prevents slipping. When fingers can fly, the work flies!

Only Parker-Kalon offers the SIZE-MARK and GEAR GRIP. Take advantage of these exclusive features—watch your product's assembly costs go down, its sales appeal go up.

SEND FOR SAMPLES and Stock List. Simply address Parker-Kalon Corporation, 200 Varick St., New York 14, N. Y.

P-K **PARKER-KALON*** *cold-forged* **SOCKET SCREWS**

SIZE-MARKED SOCKET HEAD CAP SCREWS • GROUND THREAD SOCKET SET SCREWS
FLAT HEAD SOCKET CAP SCREWS • STRIPPER BOLTS • PIPE PLUGS • HEX KEYS

AVAILABLE EVERYWHERE THROUGH ACCREDITED DISTRIBUTORS

*TRADE MARKS REG. U. S. PAT. OFF.

More Beef in the Body

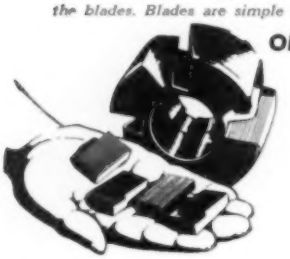
For the heaviest cuts that the biggest milling machines can pull.

OK Face Mills, size for size, have more weight, more substance, more beef in the body. And blades are huskier with a greater proportion of carbide available for cutting. It is a proven fact these cutters remove more metal in a given period than other cutters which are complicated and weakened by recesses for screws, pins, gibs or locking devices.

OK cutters consist of just two components — the body and the blades. Blades are simple wedge-shaped blocks, serrated on one face with matching serrations in the body. They are solidly seated by a driving fit, easily extracted with a drift, and stay put under the fastest speeds and heaviest feeds. The simple strength and ruggedness permit the placement of more blades in the fine pitch series and heavier blades in the coarse pitch series.*

You need the OK competitive advantages. Take your toughest job and let OK engineers have a go at it.

OK CUTTERS WILL OUTPULL ALL OTHERS

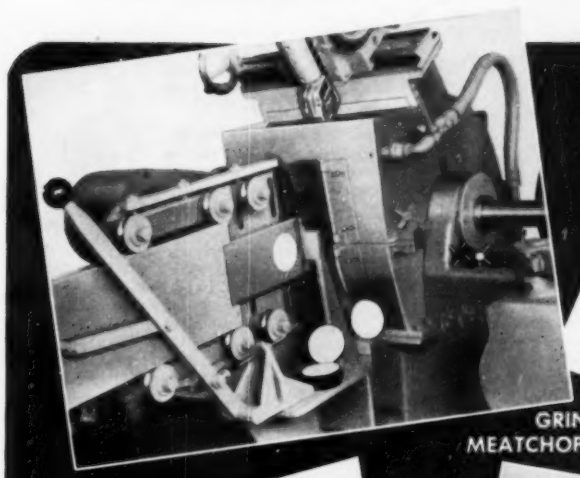


THE OK TOOL CO., Inc.
SHELTON, CONN.

*The wedge is the world's simplest and strongest basic mechanical device.

GARDNER-GRIND

for Moderate Production on Parallel— Surface Parts



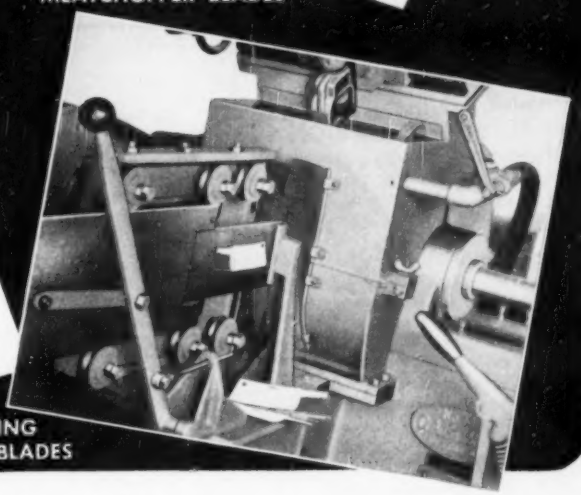
GRINDING MEATCHOPPER BLADES

WORK DATA

Part Meatchopper Plates
Material Steel
Operation Grind two Parallel Sides
Tolerances .001" Flatness .003"-.004 Uniformity
Stock Removal .020" to .030" Overall
Production 75 To 100 Per Hour
Feed Hand Load and Unload to Roller Gun-Type Fixture
Machine No. 14A-20" Gardner Grinder

WORK DATA

Part Cleaver Blades
Material Steel
Operation Grind two Parallel Sides
Tolerances .002"-.003" Parallelism
Stock Removal .010" to .015" Maximum Overall
Production 3 to 4 Pieces Per Minute
Feed Hand Load and Unload to Roller Gun-Type Fixture
Machine No. 14A-20" Gardner Grinder



GRINDING CLEAVER BLADES

GARDNER-GRIND
Your Flat Surfaces

AT a moderate investment you can equip your plant with one or more of these Gardner **Double** Grinders for handling jobs similar to the two illustrated. The result — **lower unit costs** to meet today's competition.

Write for our DOUBLE GRINDING Bulletin!

GARDNER MACHINE COMPANY

410 EAST GARDNER STREET . . . . BELOIT, WISCONSIN, U.S.A.

New

FLEX-a-FOAM Filter Mask

Dust Protection

Your Workers Welcome

and *WEAR*

Simple construction (only four interlocking parts), breathing ease and attractive styling of the new Flex-a-Foam Filter Mask assure real wearing acceptance by your workers.

Featherweight positive-locking frames of molded plastic adjust themselves with comfortable snugness to every size face. Of DuPont Polythene, frames are so tough they're unbreakable in normal usage.

Flex-a-Foam's filter is a honeycomb construction of whipped foam latex – keeps out non-toxic nuisance dusts as small as 1/25000 of an inch! It holds its shape and can be washed in warm, soapy water for long sanitary usage. It's easier to breathe through than an ordinary pocket handkerchief!

Headband of molded natural rubber with exclusive method of adjustment that keeps mask snug and comfortable – no tension or hair pulling.

Workers enjoy its comfort, and you like the efficiency and economy of Flex-a-Foam, lowest priced *quality* respirator ever made. Send $1.50 for postpaid single mask.

ATTENTION AGENTS AND JOBBERS

Your interest is invited

The Goggle Parts Company – Dept. A, Cleveland 13, Ohio

Please send full information and prices on Flex-a-Foam Filter Masks.

Name_____

Position_____

Company_____

Address_____

City_____ Zone_____ State_____

THE GOGGLE PARTS COMPANY

CLEVELAND 13, OHIO

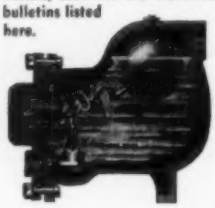
Send for Nicholson Bulletins on These

4 WAYS TO SAVE TIME

in Production and Maintenance

On the basis of their time-saving records, leading shops are increasingly standardizing on these 4 Nicholson units. For details, send for the individual bulletins listed here.

NICHOLSON EXPANDING MANDRELS—Set of 14 does work of 209 solid arbors; sensational time savers in some operations. Sold singly or in sets; for bores ½" to 7". Bulletin 1043.



NICHOLSON ARBOR PRESSES—A ready, precision tool for bending, pressing, assembling, broaching, etc. 5 sizes: for 5¾" to 20" diam.; light to 5-ton capacity. Bulletin 845.

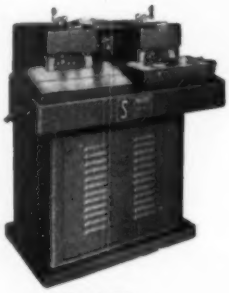
NICHOLSON AIR TRAPS—For intercoolers, aftercoolers, receivers, tanks, etc. Non-wire drawing valve opens and closes instantaneously. This feature with extra large drainage capacity effects fast, positive action. 3 types for pressures to 1500 lbs. Catalog 448.

NICHOLSON CYLINDER CONTROL VALVES—Specially treated hard seats, choice of metals for specific mediums, and easy repacking cut maintenance time. 2, 3, 4-way and special types. All manner of operation. Size ¼" to 2½"; pressure to 5000 lbs. Catalog 546.

W. H. NICHOLSON & CO., 114 Oregon St., Wilkes-Barre, Pa.

SEE FOR YOURSELF!

FROM ROUGH TO FINISH GRIND IN ONE STEP!

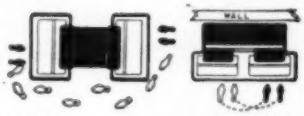


TYPE 10 TD TWIN WHEEL TOOL GRINDER

HEAVY DUTY

WET OR DRY

10" - 14" WHEELS



OLD WAY

Lost time between rough and finish grind.

Floor space wasted — Grinder must be away from wall.

NEW WAY

One step from rough to finish grind.

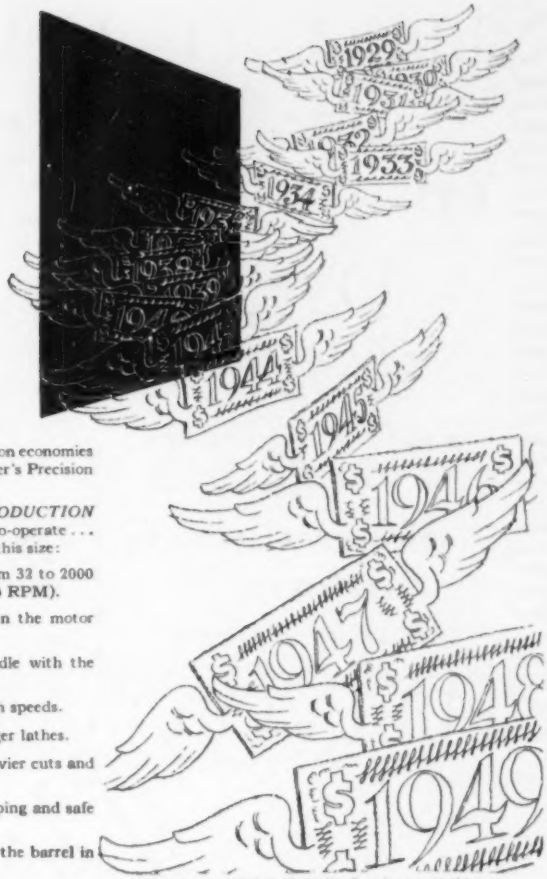
Conserve floor space —place Grinder against the wall.

BULLETIN 10 IS JUST OFF THE PRESS! WRITE TODAY!

THE STANDARD ELECTRICAL TOOL CO.

2487 RIVER ROAD **CINCINNATI 4, OHIO**

Are you still paying for equipment you bought 20 YEARS AGO?



YOU CERTAINLY ARE . . . if you are losing the production economies you can obtain with the modern WADE No. 8A Toolmaker's Precision Lathe. Obsolete equipment is *expensive to own!*

You can *CUT your COSTS*, and *INCREASE your PRODUCTION* with the "8A", a lathe that is smooth-running, quiet, easy-to-operate . . . with features you would never expect to find on a lathe of this size:

Variable Speed Drive, with stepless spindle speeds from 32 to 2000 RFM. (With back gears engaged, speeds are from 32 to 220 RPM).

Electric Tachometer registers spindle speeds only when the motor is running.

Clutch permits you to start, stop, and brake the spindle with the motor running.

Ample Torque for low speeds; matched V-belts for high speeds.

Rear Station Tool Block previously found only on larger lathes.

Ample Front Guideway on the bed. You can take heavier cuts and obtain finer finishes, free of chatter!

Thread-lock Spindle Nose for accurate, positive clamping and safe driving of face plates or jaw chucks.

Full-bearing Tailstock has a bearing the full length of the barrel in any position.

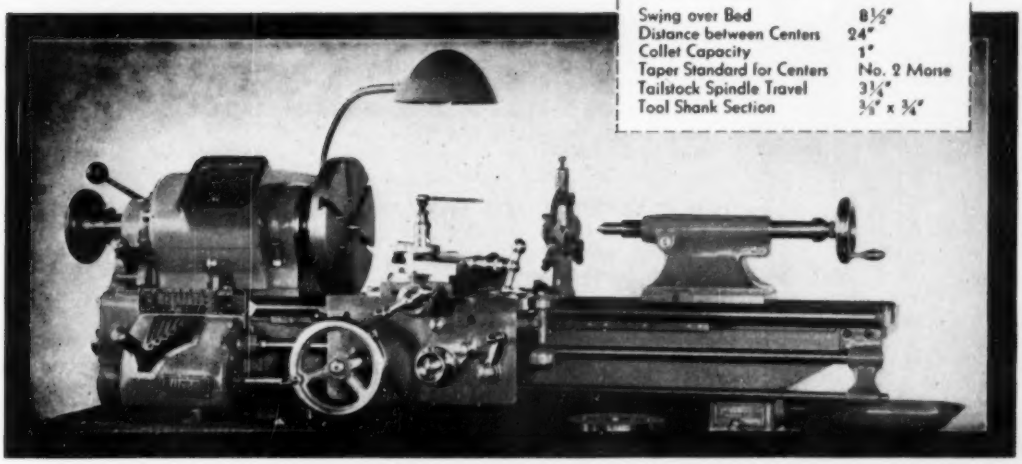
Complete Electrical System with reversible starter.

Send for the "8A Bulletin." See for yourself how you can save by having this fine lathe in your plant. You will understand why—more and more—"industry is turning the Wade way!"

THE Wade TOOL CO., 53 River St., Waltham, Mass.

SPECIFICATIONS

Swing over Bed	8½"
Distance between Centers	24"
Collet Capacity	1"
Taper Standard for Centers	No. 2 Morse
Tailstock Spindle Travel	3¼"
Tool Shank Section	⅝" x ¾"



The

GOSS & De LEEUW

ONE TWO THREE

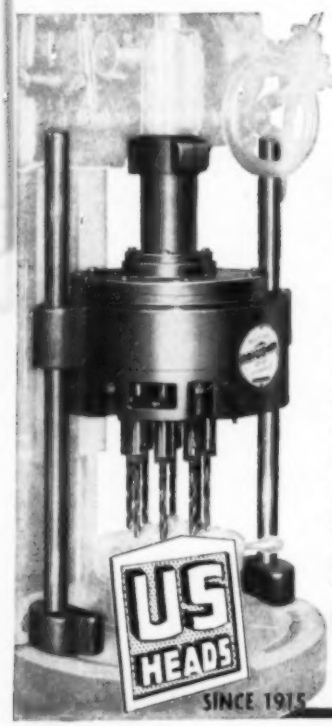
7 spindle tool rotating automatic chucking machine

Four Machine Spindles for boring, turning, facing and reaming operations on one to three ends provide greater and quicker production than any other "chucker" in the machine tool industry.

Three Threading Spindles perform from one to three right or left hand single or double threading operations, on one, two or three ends simultaneously, in perfect alignment, at productions from 100 to 500 pieces per hour.

Write for further interesting details

Goss & DeLeeuw
MACHINE COMPANY
KENSINGTON, CONNECTICUT, U.S.A.



Designed for You!

ADJUSTAFIX MULTIPLE SPINDLE DRILL HEAD

This head is designed to reduce drastically multiple drilling costs by eliminating expensive changes in set-up from job to job.

As much as 90% of the drill head can be left intact, yet a complete engineering change-over is accomplished by simply changing the drill pattern plate and relocating spindles on the new pattern plate to conform to the new design.

The spindle and idler constructions are entirely separate assemblies both being self contained. For this reason, the use of compound gears on the idler shaft gives exactly the tool speed required for a given job. No change of gearing is necessary in the main drive box when tool speed is changed.

THE ADJUSTAFIX MULTIPLE SPINDLE DRILL HEAD can be easily installed on the machines you are now using, and can be used not only for drilling, but for tapping, reaming, spot-facing, boring, counterboring, and milling operations as desired.

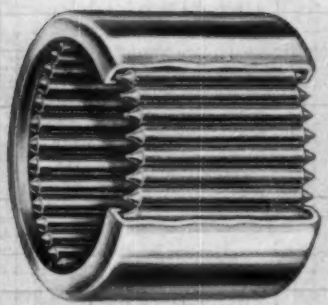
ALL ADJUSTAFIX MULTIPLE heads have fully automatic lubrication for either horizontal or vertical operation.

UNITED STATES DRILL HEAD CO. 616 Burns Street,
CINCINNATI 4, OHIO

• *We manufacture all types of multiple spindle, fixed center, adjustable and lead screw tapping heads.*

TORRINGTON NEEDLE BEARINGS

contribute to compact design



For high load capacity in restricted space, Torrington Needle Bearings are unequalled by any other type of anti-friction Bearing.

Assemblies incorporating Needle Bearings are models of engineered compactness, simplicity and efficiency. This engineering advantage of Torrington Needle Bearings has contributed to important design advances in many products. When your problem is to secure compact, lightweight design with high unit capacity, the Torrington Needle Bearing is specially engineered to meet your requirements.

THE TORRINGTON COMPANY
Torrington, Conn. • South Bend 21, Ind.
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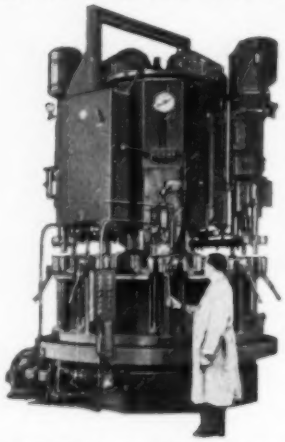
TORRINGTON *NEEDLE* BEARINGS

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • BALL • NEEDLE ROLLERS

How to Combine Machining Operations in Less Floor Space

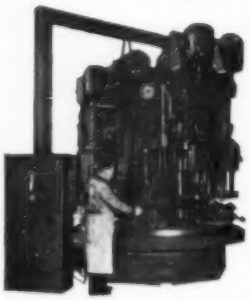
Here are two interesting examples of high production machining in relatively small floor space. Rather than string each operation out in a long line with conveyors, the operations are performed in fixtures held on a rotary indexing table.

5 OPERATIONS ON 240 PARTS PER HOUR IN 79 SQ. FEET . . .



This type VSI vertical indexing drilling machine is designed for drilling, reaming and chamfering five bolt holes and drilling and chamfering one 18" hole in automotive rear axle.

4 OPERATIONS ON 130 PARTS PER HOUR IN 84 SQ. FEET



This type VSI special vertical automatic indexing machine is provided with eight two station fixtures for holding one each right and left hand spindle assembly supports. Operations include drilling, reaming, chamfering and sawing. While each head is hydraulically actuated, on the machine illustrated, electrical mechanical heads are also available.

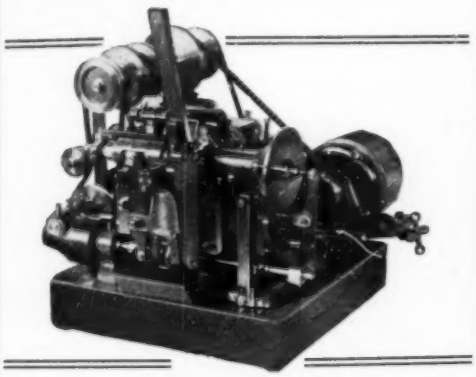
Write for free additional information today. Ask for bulletin 160.

DAVIS and THOMPSON CO.
MANUFACTURERS OF *Machine Tools*
MILWAUKEE 14, WISCONSIN

TRADE
TUMICO
MARK

TUBULAR MICROMETER CO.
ST. JAMES, MINNESOTA, U.S.A.

WALTHAM
PINION AND GEAR CUTTING MACHINES



Fast, Convenient, Compact, Accurate

Designed to make high speed production of small gears and pinions available for assembly in watches, instruments, gauges, fuses, etc. Made in Single-Cut, Multiple Cut and Magazine-Feed types. Simple to operate; require no special skill.

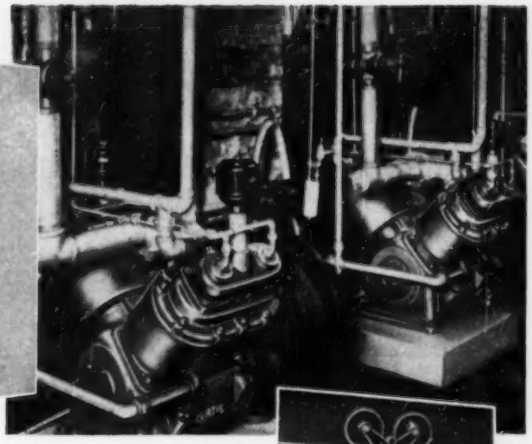
Send for detailed information and complete specifications.

WALTHAM MACHINE WORKS
High Street, Waltham, Mass.

Reduce Production Costs

with CURTIS

AIR COMPRESSORS, AIR HOISTS AND AIR CYLINDERS



Plant after plant is turning to Curtis Air Hoists and Cylinders for pushing, pulling, lowering or lifting operations... and to multiple installations of Curtis Air Compressors, which eliminate long air lines, the possibility of air leaks, and losses resulting from breakdowns of central air compressor installations.

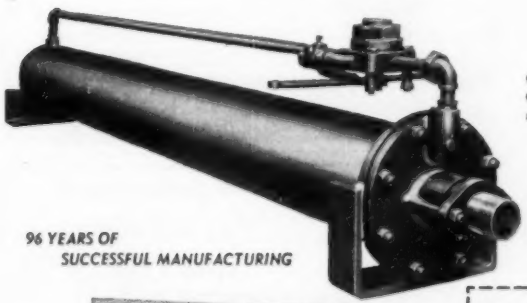
Here's why it will pay you to consider CURTIS *equipment*

AIR HOISTS AND AIR CYLINDERS

- Cannot be overloaded.
- Hoisting or lowering speed is controlled by operator.
- Ground-steel cylinder.
- Disc type valves.
- Valve automatically returns to vertical position when released.
- Can be operated by unskilled labor.

AIR COMPRESSORS

- Timken-Bearing equipped—permits external adjustment.
- Self oiling—positive lubrication.
- Precision construction throughout.
- Complete valve assembly removed or replaced in a few moments.
- Cylinder, crankcase, also heads made from gas-tight iron.
- Fully enclosed.



Curtis bracketed-type Air-Hoist Cylinder can be placed in any position from horizontal to vertical.

Curtis Pendant Air Hoist can be used for practically any lifting problem where the head room is not limited.

96 YEARS OF SUCCESSFUL MANUFACTURING

CURTIS

PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1924 Kienlen Avenue, Saint Louis 20, Missouri

Curtis Pneumatic Machinery Division of Curtis Mfg. Co. 149-4
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I am interested only in items checked below:

- ☐ Air Hoists
- ☐ Air Cylinders
- ☐ Air Compressors

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STREET_____
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It takes more than "SAY-SO" to make a "BRALE" Diamond Indenter

As sole manufacturer of the genuine "ROCKWELL" Hardness Tester and originator of the universally accepted ROCKWELL Hardness scales, Wilson holds a deep *responsibility*. Every product bearing a Wilson name *must* have accuracy that approaches perfection. And "BRALE" is a Wilson name.

Remember, an inaccurate hardness test is worse than no test at all as it will pass defective material and reject good material. All the accuracy in your "ROCKWELL" Hardness Tester is lost if inferior penetrators are used. Keep in mind that one point of hardness on the Rockwell Scale represents a depth of only 0.00008".

WILSON
MECHANICAL INSTRUMENT CO., INC.
AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.

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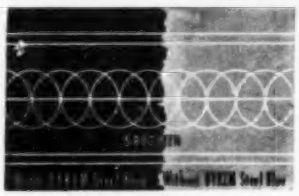
DYKEM STEEL BLUE

STOPS LOSSES
making dies & templates



Simply brush on right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information

THE DYKEM COMPANY, 2301 B North 11 St., St. Louis, Mo.
In Canada: 2400 Dundas St. West, Toronto, Ont.

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Willey's — The COMPLETE LINE of cutting tools — made complete in our own factories. Hundreds of standard sizes in stock. Prompt service on special tools built to your specifications.

We are now filling orders calling for the new industry standard tool numbers and sizes.

CATALOG

Mailed on request. Please use your business letterhead.

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SOLID TUNGSTEN CARBIDE REAMERS

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CARBIDE ROUTER BITS

WILLEY'S CARBIDE TOOL CO.
1242 W. Vernor Highway — Detroit 1, Michigan

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● MEISEL produces but one *kind* of gears . . . gears constructed for specific jobs. Only through the inherent accuracy of this special designing could such dependability, performance and economy be possible. Tell us what you expect it to do, and we'll show you the *one* gear suited for your job.

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If you operate a press room find out about *Littell* REELS

Speed up your blanking and cupping. Littell Reels use time-saving, money-saving coil stock. No lost motion for continuous insertion of sheet stock. Less scrap. Automatic work possible.

Littell Reels are self-centering for smooth feeding. They never overrun. Adjustable heads. Quick loading. Send for full details on the Littell line.

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PROFITS are Skin Deep!

Safeguard All Hands

with WEST LAN-O-KLEEN HAND CLEANER...

(contains protective lanolin)

Up or down? Which way your profits go may depend on your production efficiency. That means vigilance against the man-hour losses resulting from industrial dermatitis. Here's where WEST LAN-O-KLEEN HAND CLEANER proves invaluable—for it gives your work-hands good protection against the costly effects of various skin irritants.

A quick-acting, thorough cleaner—LAN-O-KLEEN contains no harsh ingredients or excessive alkali. Prepared of a fine cornmeal base, it effectively removes deep-rooted grit, soil and grime—yet it's *gentler* on sensitive skins. Nor is that all! LAN-O-KLEEN is *super-fatted* with a *higher percentage* of soothing, beneficial *lanolin* than are *ordinary* super-fatted soaps. Impregnated into LAN-O-KLEEN by an exclusive process, this lanolin has been proved to have a retarding effect upon the defatting action of soap. As a result, the skin gets added protection against natural oil-losses.

LAN-O-KLEEN, in powder form, is dispensed through an economical soap dispenser especially designed for the product. Numerous plants have made it a wash-up standby. We'll be glad to show you how your plant can profit by it.

SEND FOR FREE SAMPLE

WEST DISINFECTING Company

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WEST DISINFECTING COMPANY 50
42-16 West Street, Long Island City 1, N. Y.

Gentlemen:

Please send me a free sample carton of LAN-O-KLEEN.

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Company _____

Address _____

City _____ State _____

BARRETT "FILWHIRL" ENAMELERS make easy work of many difficult coating problems

The Barrett "Filwhirl" is a Centrifugal Enameler providing a clean, sure and economical way of applying finishing materials to parts or products that can be rotated in fair balance in the revolving bowl. It wastes no coating material, and reduces time and expense when compared with other methods of applying a good commercial finish. It is designed for bulk handling, and can be depended upon for speedy production requirements.

It has proven highly successful in the coating of helical springs, clips, clasps, zipper parts, bead and link chain, toys, automobile and luggage hardware, misc. metal stampings, castings, etc. Excellent results are also obtained with japan, lacquers, varnishes, paints, waxes. No drips or fatty edges.

Furnished in spindle post, fixed bowl, and carrier types, in several capacities. Safety features included and auxiliary equipment is available.

Send a few representative samples to be processed and submitted for your examination.

The Barrett Centrifugal Enameler.

THE LEON J. BARRETT COMPANY, 1800 Grafton Road, **WORCESTER, MASS.**

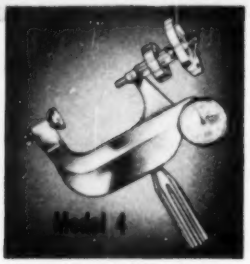
Designers and Builders of Centrifugal Machinery

Ames Precision HARDNESS TESTERS
FOR ROCKWELL HARDNESS TESTING

Today, hardness testing is coming into universal use as a necessity in the working and fabricating of metals. With Ames Testers, readings are made accurately, quickly, on-the-spot, directly in the Rockwell Hardness Scales.

For testing round and flat stock, tubing, saws, knives, etc., up to one inch in Rockwell A, B and C Scales. Weighs only 1½ lbs.

For testing rounds and flats, dies, odd-shaped pieces, etc., up to two inches in Rockwell A, B and C Scales. Weighs 2½ lbs.



For testing up to four inch capacity directly in Rockwell A, B and C Scales. Throat depth two inches. Weighs 3¼ lbs.

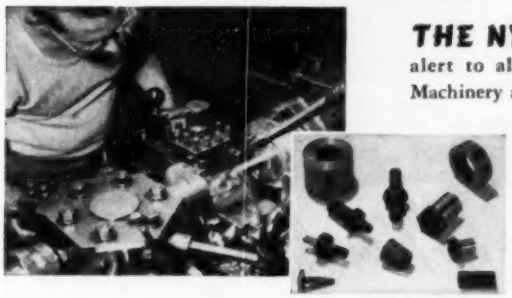
Cast Iron Bench Stand permits use of both hands when testing small parts. Tester is inclined at convenient angle and is firmly clamped in stand.

Box for Tester and Accessories Equipment includes diamond and 1/16" ball penetrators, two anvils, two steel test blocks, one brass test block and Rockwell Conversion Chart.

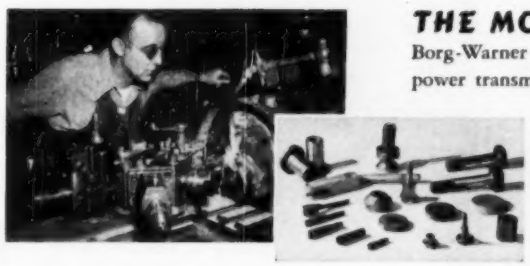
AMES PRECISION MACHINE WORKS
WALTHAM 54, MASS.

PRODUCE 1 to 12 PIECES *profitably* ON TURRET LATHES

THE O. M. EDWARDS CO., INC., of Syracuse, N. Y., makes accurate parts for trapdoors, retractable steps, and double glazed windows they supply for modern railroad equipment. Lots of 1 to 10 pieces are usually routed to Warner & Swasey turret lathes. In addition to reduction in setup time, they have noted a 43% production increase on all jobs—large or small—run on their No. 3 Warner & Swasey.



THE NYE-WAITE COMPANY of Auburn, N. Y., is alert to all improvements in carpet-making machinery. The Machinery and Repair Division builds the special machines needed. Scores of different jobs of less than 10 pieces are common, some of 1 or 2 pieces. A Standard Tooling setup on their No. 3 Warner & Swasey reduces setup time so these small-lot jobs can be machined profitably.

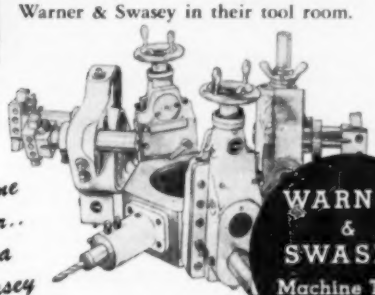


THE MORSE CHAIN COMPANY, a Division of Borg-Warner Corporation of Ithaca, N. Y., manufactures mechanical power transmission equipment. They use Warner & Swasey No. 3, No. 4, 1-A, 2-A, 3-A, and 4-A turret lathes to handle a large variety of small lots—1 to 12 pieces in each. Morse Chain solved the problem of producing small-lots profitably so well that they now use a No. 4 Warner & Swasey in their tool room.

STANDARD TOOLING SETUPS

Most shops find they can do more jobs faster on Warner & Swasey Turret Lathes with Standard Tooling Setups. It permits multiple and combined cuts, with shorter setup time for profitable production increases.

Standard Tooling Setups and the right tools which can help you increase your output are all covered in the new 194 page Warner & Swasey Tool Catalog. Write for your copy.



You can machine it better, faster.. for less with a Warner & Swasey

WARNER & SWASEY
Machine Tools
Cleveland

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

H&G DIE HEADS

WITH INSERT CHASERS

FOR ALL MACHINES USED FOR CUTTING SCREW THREADS

The famous H & G Die Heads come in styles and sizes for all types of machines, including threading machines, chucking machines, drill presses, turret lathes, and automatic screw machines, such as Brown & Sharpe, Cleveland, Cone, Davenport, Economy, Foote-Burt, Greenlee, Gridley, Acme-Gridley, New Britain, New Britain-Gridley, Swiss, etc.

The small, inexpensive high-speed steel insert chasers are held by rugged carriers and cut threads straight and true to the close tolerances required.

The majority of expert production men prefer these die heads because of the ease with which insert chasers are resharpened and set, the low cost of insert chasers and the greater quantity of threads per grind and number of pieces threaded per chaser dollar.

The reduction in inventory will pay for new die heads. **For example:** If you have $1,000 in chaser inventory, changing to H&G will require only $300, setting free $700 for the purchase of new H&G heads. This is due not only to low cost of chasers, but to interchangeability and long life.

Send for Bulletin 32 "Selecting Proper Die Head for the Job."

THE EASTERN MACHINE SCREW CORPORATION

20-40 BARCLAY STREET **NEW HAVEN, CONN.**

Mfrs. General Purpose Die Heads, Insert Chaser Die Heads, Threading Machines.

STONE *Swing-Cut* METAL Cut-Off Machine

★ **Greater Capacity**
Cuts up to 3" solids and 4" pipe

★ **Faster Cutting**
Cuts any metal in seconds.

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Cuts any angle from straight to 46° in quick change, self centering vise.

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Less operator fatigue — more operator confidence.

★ **Low Price**
Offers you much more cutting capacity per dollar than any other abrasive cut-off machine.

Write for bulletin and name of your nearest dealer.

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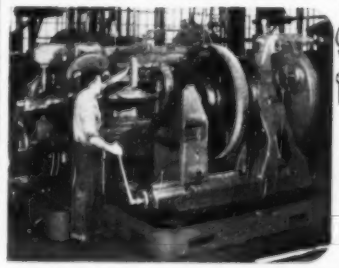

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This 18 ton Herringbone Continuous-tooth Generator, handling gears and pinions up to 60" PD, 2 DP, is a recent addition to Stahl's modern equipment. Stahl skill and experience, plus the finest precision machines, assure accurate, durable gears in all sizes. For the economical answer to any gear problem get a Stahl estimate first.

SPURS TO 72" PD, 1 DP
BEVELS TO 54" PD, 1 DP
SPIRAL, HELICAL and WORM GEARS TO 48" PD, 2 DP
CONTINUOUS-TOOTH HERRINGBONE TO 60" PD, 2 DP
SPROCKETS TO 72" PD, 2½" CP
RACKS TO 20 FT. LONG, 3 DP
SILENT GEARS; RAWHIDE, BAKELITE, FABROIL
HEAT-TREATED, CASE OR FLAME HARDENED GEARS — OF CARBON OR ALLOY STEEL

Stahl

GEAR & MACHINE COMPANY
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NOW...

Only $975 for this Precision Lapping Machine

adaptable to a wide range of work

- ★ ***Produces a superfine finish on plane or cylindrical surfaces***
- ★ ***Ideal for tool room or small lot manufacture***
- ★ ***Provides a full 24" diameter of lapping area***
- ★ ***Low in cost . . . Economical in operation and maintenance***

Here's a lapping machine that will impart that last critical element of precision and finish to your parts. Yet it is inexpensive and has plenty of speed and capacity. In many cases, it will eliminate the need for far more costly and complex machine tools.

Easy to Use! The operator has only to hold the work against the revolving lapping plate. For cylindrical lapping, the work is placed in a special fixture and rolled against a plain surfaced plate; for flat lapping, a grooved plate is recommended. Plates are readily interchangeable as lapping needs vary. A plain plate is furnished as standard; machine with grooved plate, $22.50 extra.

Write today! Mail the coupon today for additional information on construction features.

Lapping cylindrical work on a Taft-Peirce Lapping Machine

THE TAFT-PEIRCE MANUFACTURING COMPANY
WOONSOCKET, RHODE ISLAND

Please send me additional information on your new lapping machine. I am primarily interested in lapping ( ) cylindrical surfaces, ( ) flat surfaces, ( ) both.

NAME.....

COMPANY.....

STREET.....CITY .....

WHEN ACCURACY COUNTS....

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FOR SPUR • WORM • SPIRAL AND BEVEL GEARS

PLAIN AND UNIVERSAL MODELS FOR SMALL AND LARGE GEARS WITH OR WITHOUT RECORDING ATTACHMENT.

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GRANT

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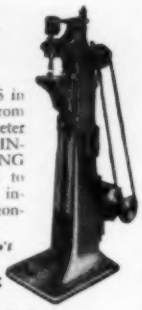
Write for literature and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.
85 Silliman Ave., Bridgeport, Conn., U. S. A.



BAUMBACH The BEST IN DIE SETS

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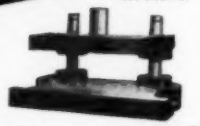

Being originators of Standard Die Sets naturally we are steps ahead in Design—Precision—Dependability and Economy. Because Baumbach Die Sets have demountable Leader Pins and Bushings, Die Set inventory is reduced as well as costly machining time. Learn about Baumbach superiority before you buy.

E. A. BAUMBACH MFG. CO., 1804 S. Kilbourn Ave., Chicago 23, Ill.

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SPUR-SPIRAL-WORM-BEVEL GEARS GENERATED WITH PRECISION ON MODERN EQUIPMENT • SEND SAMPLES OR BLUEPRINT FOR QUOTATION!

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Precision Die Made—Lowest Possible Cost.

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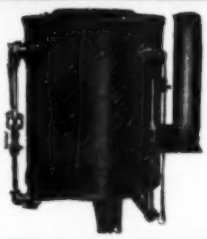
BUZZER *Gas Fired* POT FURNACES



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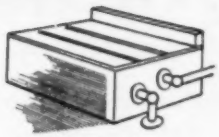

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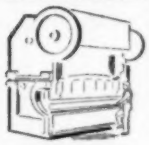

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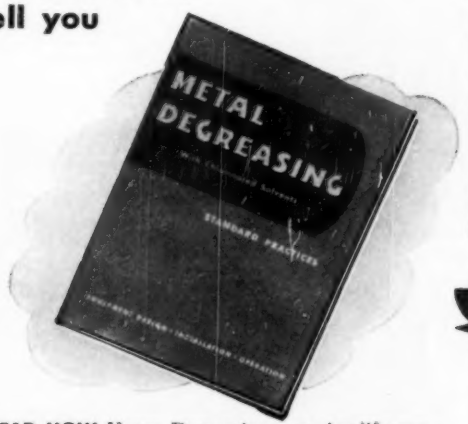

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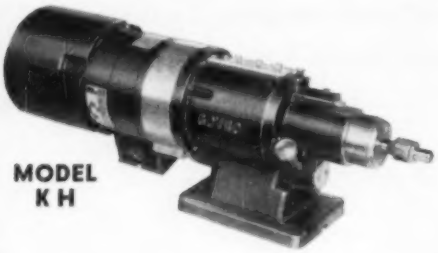

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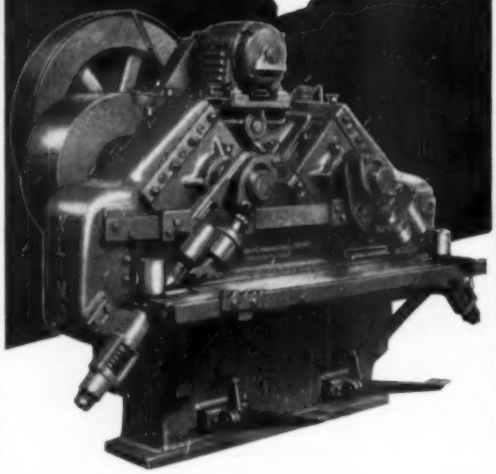

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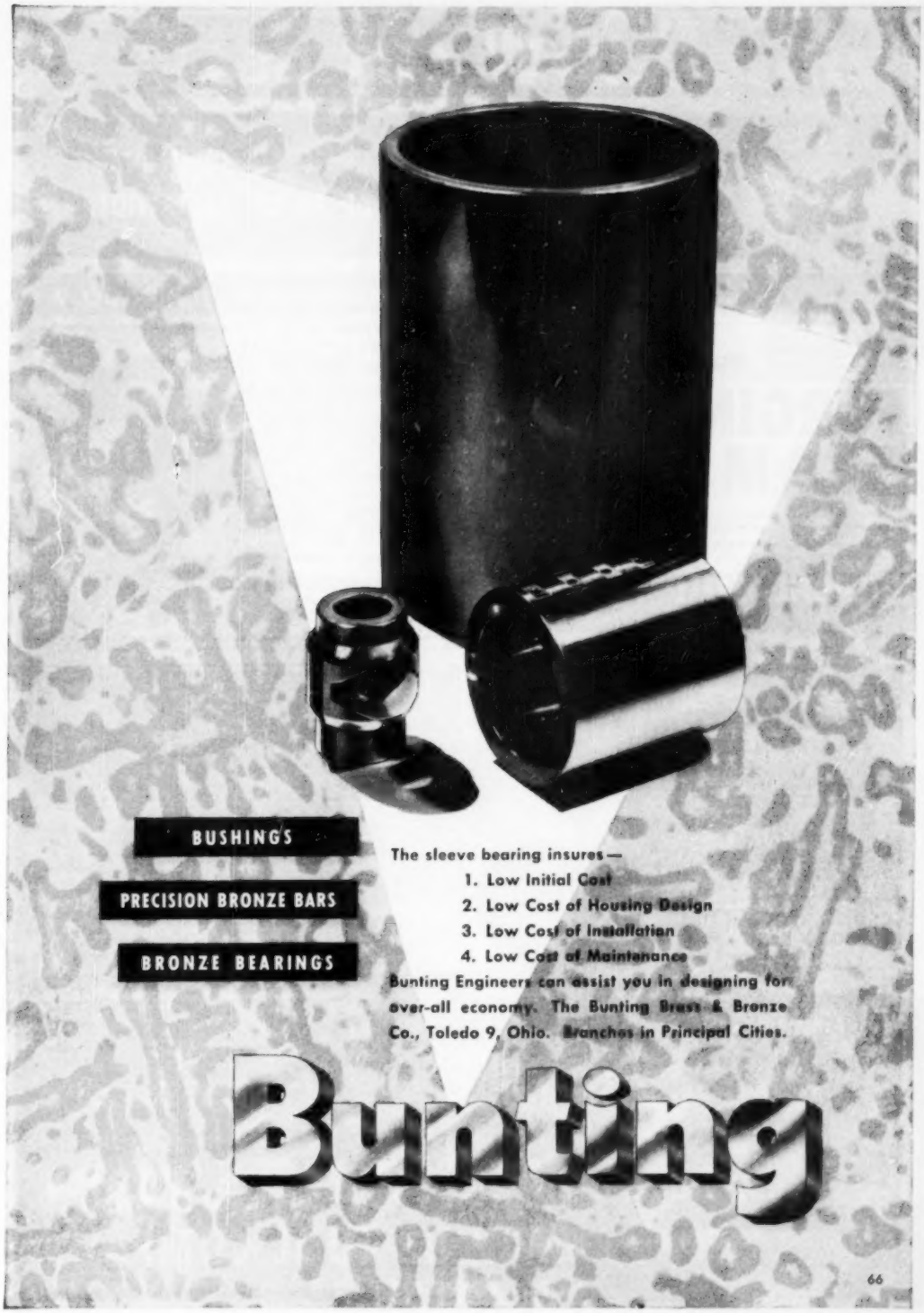
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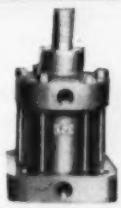

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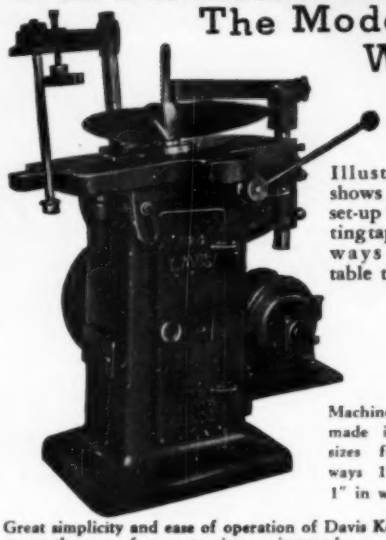

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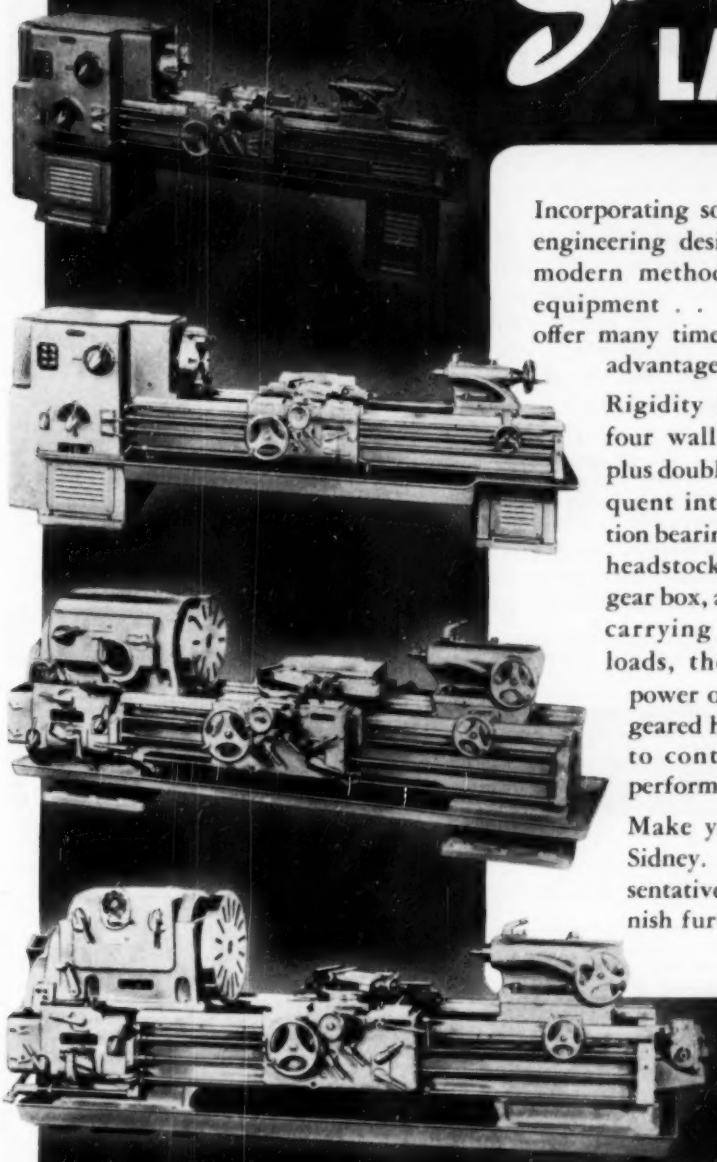

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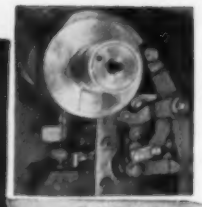

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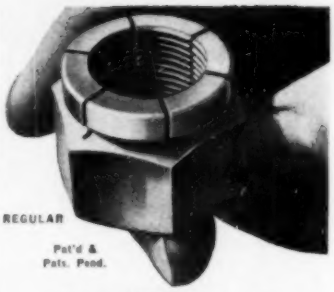

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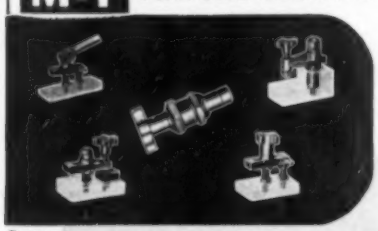

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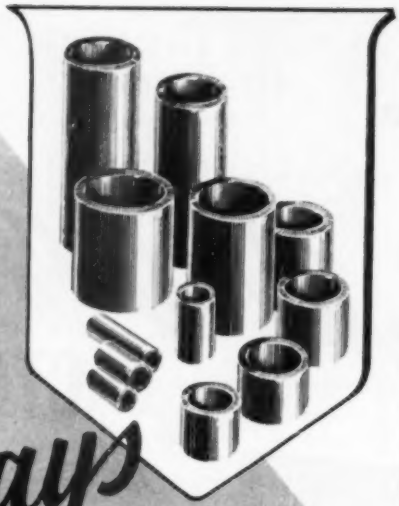

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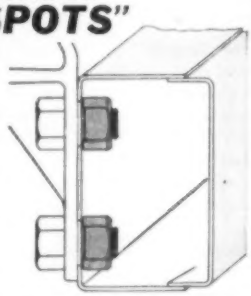
RAPID ASSEMBLY and accuracy are assured by the Midland Welding Nut because it is *self locating*. Collar on nut locates into pierced hole in receiving member. Eliminates use of locating pins or fixtures.

PARTICULARLY USEFUL IN "BLIND SPOTS"

The Midland Welding Nut in concealed and hard-to-reach places, as shown here, speeds up production materially.



Midland Welding Nuts offer numerous other time-saving and cost-saving advantages.

Write, wire or phone us for complete information.

The MIDLAND STEEL PRODUCTS CO.

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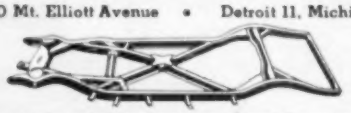

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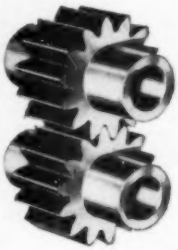

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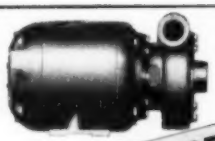

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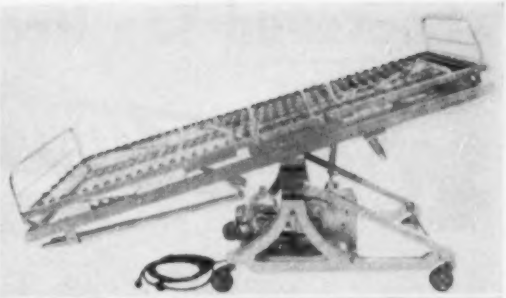

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SETS THE PRESCRIBED SPEED FOR THE FAMOUS

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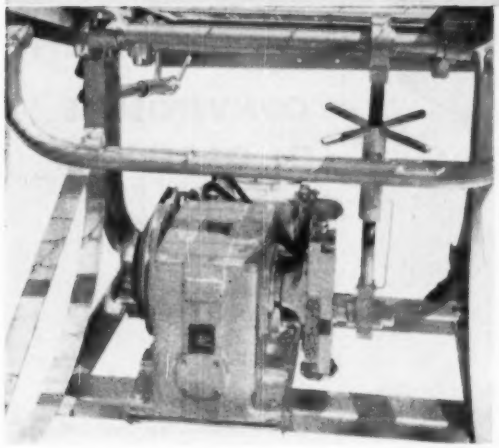

The VASOSCILLATOR BED, pictured above is an accepted treatment for Buerger's Disease (hardening of the arteries). Tested for the treatment of polio and other vasculatory ailments, it is winning wide popularity among government institutions, hospitals and medical men all over the country. Its gentle, rocking motion provides patient comfort and aids materially in the treatment of respiratory diseases.

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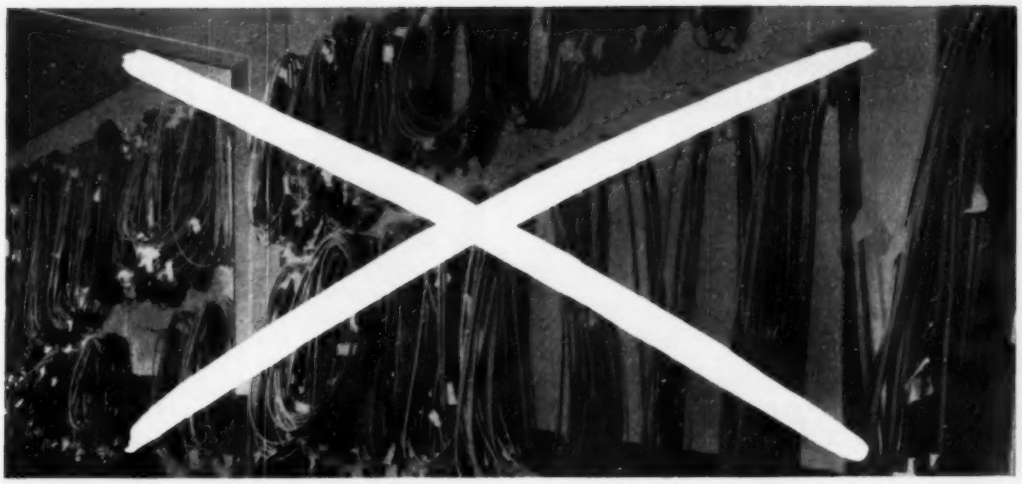
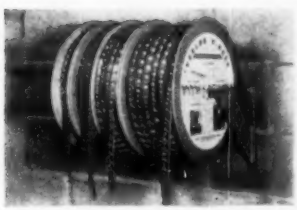
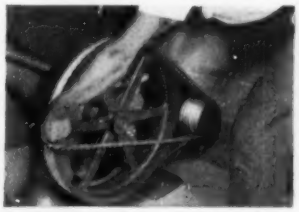


Here's how to cut your v-belt costs

You can replace up to 316 sizes of endless v-belts with just 4 reels of Veelos



From these four reels of Veelos you can make up 316 sizes of O, A, B and C section endless v-belts.



Any length belt can be coupled for quick installation on any drive in a few minutes.

Machine downtime is practically eliminated. Sliding or pivoted motor bases are not needed.

MAYBE you need belts of only one or two widths—but many different lengths—to keep all your drives producing. Then one or two reels of Veelos will give you a *complete* v-belt inventory.

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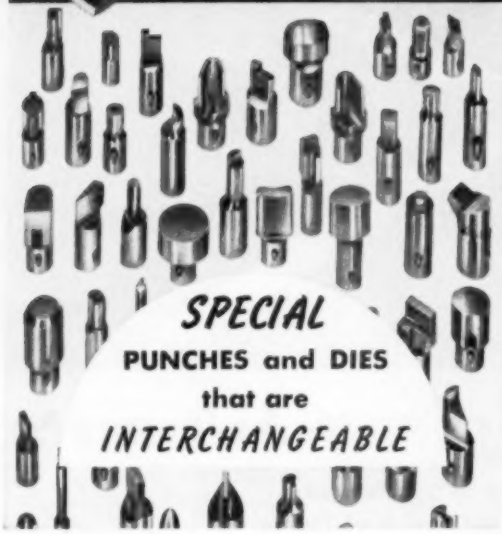

Punches and dies with irregular shapes, for combination piercing and forming, or from special alloys, can be completely interchangeable just as all standard punches and dies. This feature and the use of standardized retainers saves time and money in the design, construction and operation of a die set.

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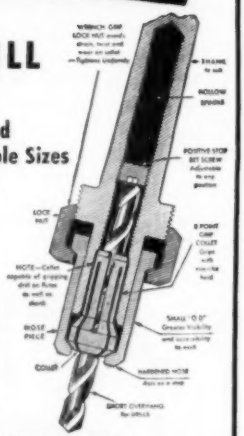

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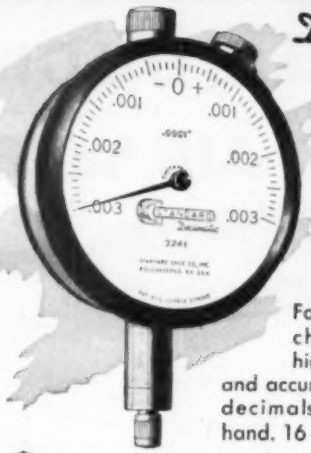

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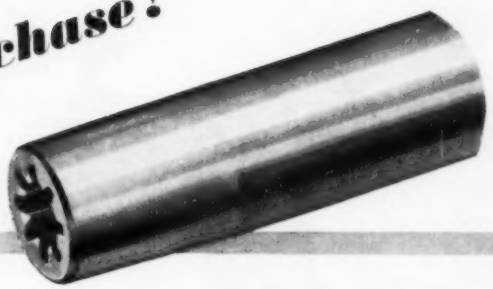

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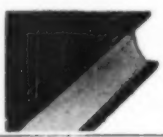

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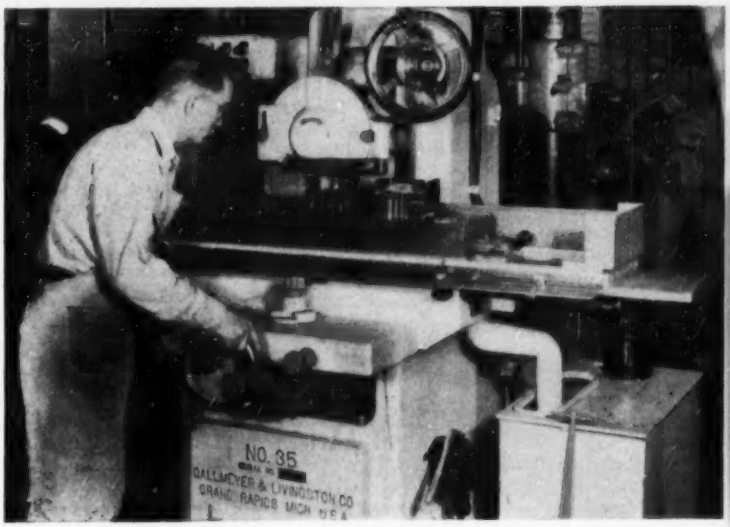

A Grand Rapids No. 35 Hydraulic Feed Surface Grinder at the Lakewood, Ohio, plant of V & S Die and Mold, Inc., who report, "It produces an exceptionally smooth finish, which is essential to us in our work."

You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

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2. **Precision ball-bearing spindle which is greased for life**
3. **Bijur one-shot lubrication system eliminating hand oiling**
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5. **Portable coolant tank for ease of coolant replacement**
6. **Vane type hydraulic pump for fast longitudinal table travel**

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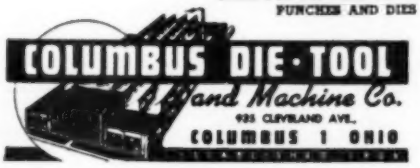

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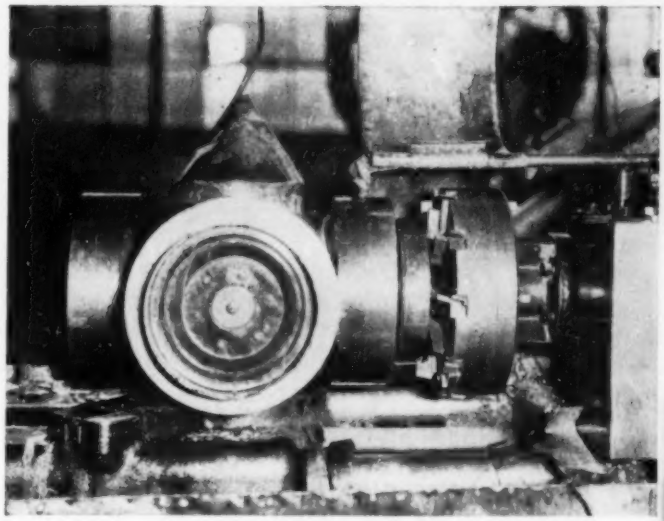

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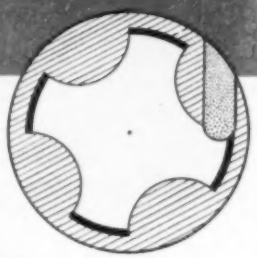

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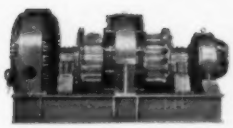

To insure trouble-free commutation in low-voltage generators you should look for such construction features as fully insulated brush holders and rigging...copper pig-tail bar which eliminates current passage thru springs and fingers, and which in turn increases brush life...copper graphite brushes to provide optimum commutator efficiency...moulded-in "equaload" shunts to distribute brush load equally, reduce resistance. Bulletin No. G-102 describes these and other features inherent in all H-VW-M Low Voltage Generators.

You can be assured of positive current control in tank rheostats by selecting tank rheostats with heavy, knife-type switches ...plus a master switch which eliminates the necessity for operating several switches each time a tank is unloaded. Also look for generous size special alloy strip resistors which reduce current losses due to overheating and insure long life. These features are all built into H-VW-M Tank Rheostats. Bulletin No. TRA-526 provides complete details.

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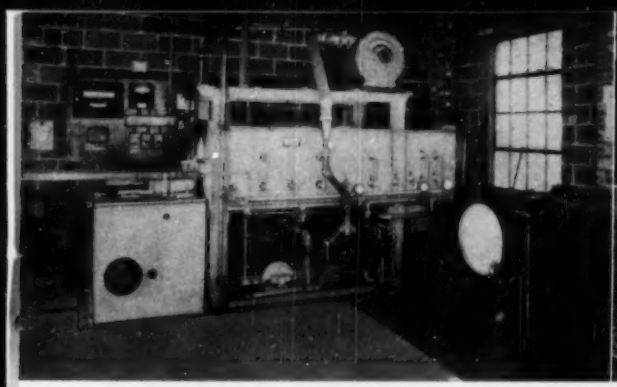

Unit and quench tank, having a capacity of 150 to 350 pounds of work per hour, heat treats screw drivers, chisels, small tools, and miscellaneous hardware. This installation at the plant of Cornwall and Patterson, Bridgeport, Conn. replaced five salt bath furnaces.

Two units, each having a capacity of 300 to 600 pounds of work per hour, normalize and harden various hand tools such as pliers, wrenches, hammers, etc. at the Peck, Stow, & Wilcox Co., Southington, Conn.

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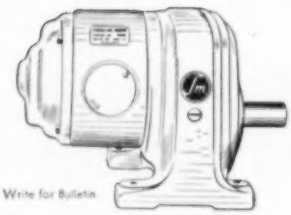

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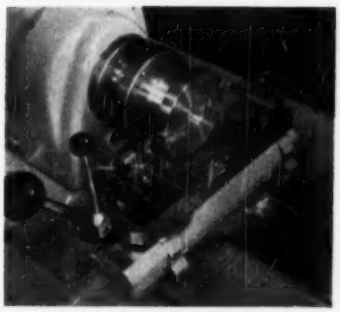

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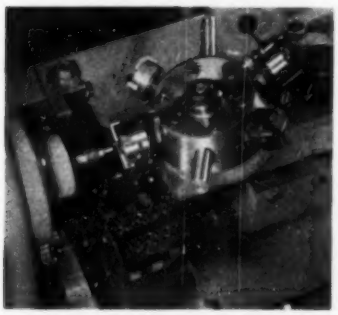

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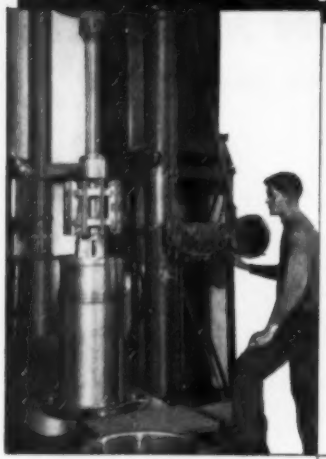

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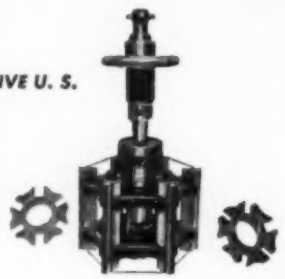

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MARVIN

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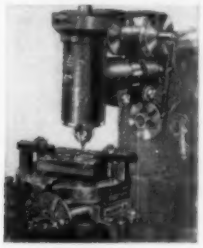

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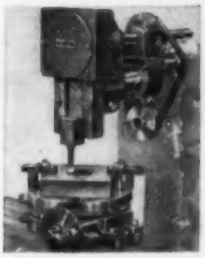

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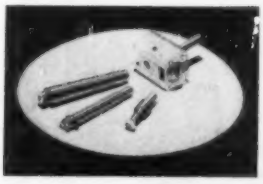

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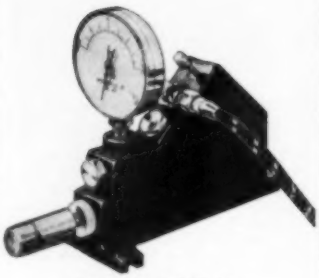

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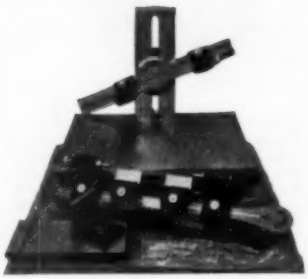

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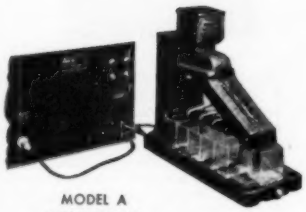

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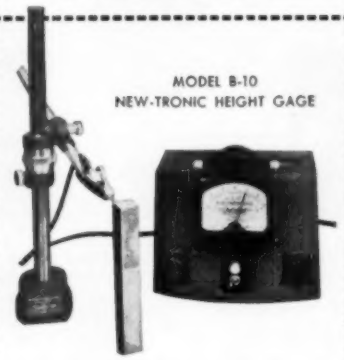

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NEW-MATIC
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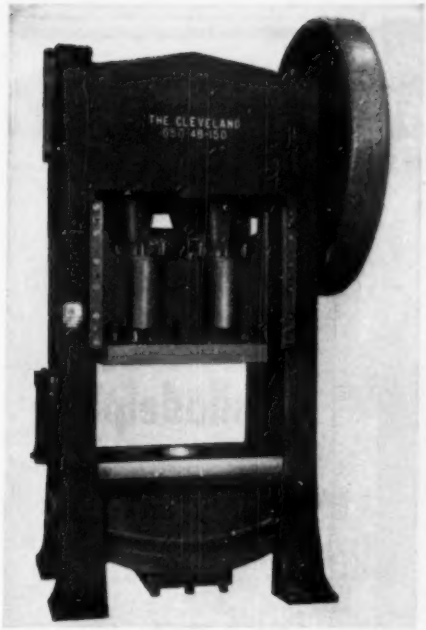
Whatever your inspection requirements, look with complete confidence to Merz precision measuring and checking machines. Every Merz product is a proved cost-cutter, a tested time-saver. The Merz line includes *New-Matic* Measuring Machines, *New-Tronic* Comparators and Gages, Checking Plates, Standard A.G.D. Gages. Merz also specializes in the custom-building of equipment for handling unusual inspection and sorting problems, however complex. Merz inspection equipment has for years been helping to reduce loss, speed production and increase profits for many of the nation's leading industries. Write for complete information on how Merz' "Four Spheres of Service" can do the same for you.

MERZ ENGINEERING COMPANY • INDIANAPOLIS 7, INDIANA

MERZ

The House That Precision Built



Cleveland straight sided Double Crank Press bed area 36" x 48", capacity 150 tons.

Cleveland straight sided Double Crank Press bed area 44" x 84", capacity 150 tons.

Specify CLEVELANDS for the "pressing" needs of 1950

The year 1950 will bring an even greater need for lower production costs. Increase man-hour output by modernizing your fabricating lines with new Cleveland Presses! Important design improvements have been incorporated in all Cleveland Presses that offer increased production economies. Cleveland engineers will gladly work with you on your production problems. If a standard Cleveland Press does not suit your requirements, one can be built to your exact specifications.

Investigate these Clevelands

- Inclinable
- Horning
- Punch Type
- Gap Type
- Straight Sided
- Knuckle Joint
- Trimming
- Single Point
- Two Point
- Four Point
- Double Action Toggle

Don't overlook the many advantages offered by the "Cleveland (patented) Drum Type Clutch".

THE CLEVELAND PUNCH & SHEAR WORKS CO. U.S.A.

Established 1880

PUNCHING TOOLS & DIES

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NEW YORK.... CHICAGO
DETROIT.... PHILADELPHIA
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POWER PRESSES

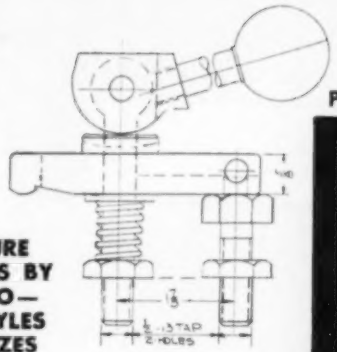
FABRICATING TOOLS

CLEVELAND 14, OHIO

WESPO SAVES YOU up to 70% ON FIXTURE PARTS COST

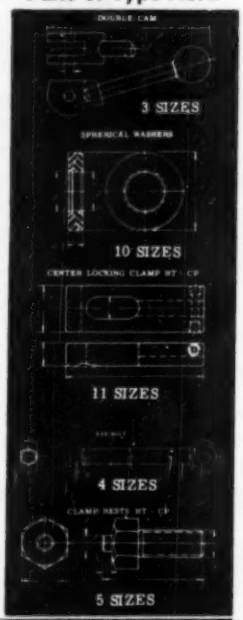
Order Complete Clamp Assemblies or any of their Component Parts

TEMPLATE DWGS OF ALL CLAMPS & PARTS SENT ON REQUEST



WESPO TYPE NO. 2, CLAMP ASSEMBLY

Below shows Parts of Type No. 2



FIXTURE CLAMPS BY WESPO— 12 STYLES 94 SIZES

Wespo Clamps and parts can be included in your fixture layouts. They are precision made of heat treated alloy steel, cadmium plated. Clamp Assemblies are made in 12 types—94 sizes.

Write for exact scale template sheets and latest bulletin.

Representatives in industrial areas. Complete stocks at factory and following:

ROCHESTER, N. Y. ..... Rekers & Roesell
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MILWAUKEE, WISC. ..... Triplex Supply Co.
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CAMDEN, N. J. ..... Fidelity Tool Supply
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WEST POINT MFG. CO.
19631 MERRIMAN COURT
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350 FIXTURE PARTS WRITE FOR CATALOG

GOOD ADVERTISING IN METALWORKING'S No. 1 MAGAZINE

SELLS MORE GOODS AT LESS COST

Going to the ASTE Show? (Philadelphia April 10-14)

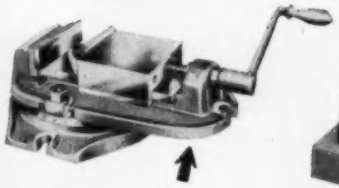
Don't miss . . .

"The Show in Print Section"

of the

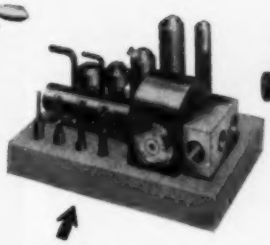
April 3rd American Machinist

NEW Bridgeport ATTACHMENTS to extend the usefulness of your BRIDGEPORT TURRET MILLING MACHINES



NEW
MILLING MACHINE VISE

An improved, high quality vise with coolant trough. Attractively styled by "Bridgeport" to conform with the design of "Bridgeport" machines. Large diameter screw assures greater gripping power and rigid work holding without hammering crank handle.



NEW
No. 2 BORING HEAD

Especially designed to fit the new 1 H.P. Bridgeport Milling, Drilling and Boring attachment. It is equipped with boring tools and holder making it possible to bore holes from 0 to 6" diameter and up.

NEW
CHERRYING ATTACHMENT

Designed for producing concave and convex shapes. Especially useful in producing drop forge dies, molds and cavities, metal core boxes, etc.

NEW
HEAVY DUTY RIGHT ANGLE ATTACHMENT

For milling and drilling at right angles.

NEW
LIGHT DUTY RIGHT ANGLE ATTACHMENT

Especially designed for milling and drilling narrow, deep molds and cavities.

NEW
1 HP. MILLING, DRILLING and BORING ATTACHMENT

Provides 8 spindle speeds from 80 to 2720 R.P.M. Back geared spindle drive unit utilizes full power at all speeds without belt slippage.
Quill travel . . . 5"
Power feed to quill in 3 steps: .0015, .003 and .006 in. per spindle revolution.
Positive 2-way power feed stop tripping mechanism.
Spindle brake and lock for convenience in changing tools.
Collet capacity up to ¾" diam.

1950 starts out with several new and highly useful attachments for the Bridgeport Turret Milling Machine. In spite of the inherent versatility of this machine, these new attachments will further extend the utility of the thousands of "Bridgeports" now in every day service, and will prove an outstanding investment for every "Bridgeport" owner.

Complete details on any and all attachments available on request.

Bridgeport MACHINES, INC.
Bridgeport, Connecticut
Manufacturers of High Speed Milling Attachments and Turret Milling Machines

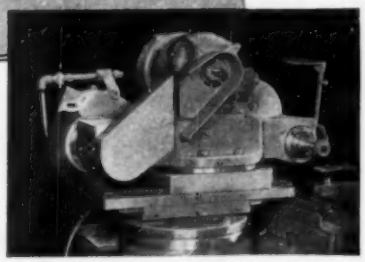
Cut "set-up" time
Slash toolroom grinding costs

with the *New* RIVETT 1024 TOOLROOM GRINDER

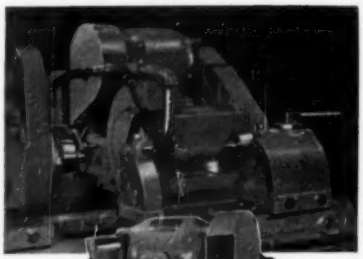
At long last! — a toolroom grinder that *does* something about "set-up" costs, far and away the most expensive item in toolroom and small lot grinding. On internal and external grinding work on straight, taper, two-angle, face and shoulder surfaces, Rivett 1024 has these *new* features to help you cut "set-up" time drastically:

1. **Double-end wheelhead** — Exclusive! Two spindles on swiveling workhead make possible rapid changes to internal or to external work. 2. **Hydraulic table reciprocation** — infinitely adjustable for speed and length of travel. 3. **Graduated swivel table and sine bar on workhead** — assure accurately measured tapers and angles. 4. **Optional work holding methods** — uses collets, step chucks, jaw chucks, plates, fixtures or "on-centers." 5. **Adjustable spindle speed** — internal from 6,000 to 35,000 r.p.m.; external 1800 or 2100 r.p.m.

And that's not all — the Rivett 1024 Grinder has been specially designed to extend the *range* of your grinding operations . . . double slides and swivels on cross slide increase possible "set-ups" *including double angles at one grind* . . . external wheel can be mounted on either end of spindle to permit face and shoulder grinding using periphery of wheel . . . positive table stop with micrometer adjustment positions work.



New! **Double-end wheelhead carries both internal and external spindles . . . swivels 180° to position either spindle. Found only on the new Rivett 1024!**



CUT COSTS ON TOOLROOM GRINDING

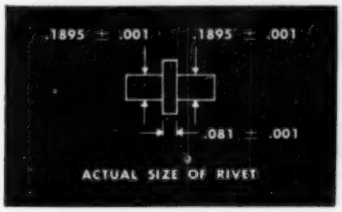
Bulletin 1024 tells the whole story in pictures and helpful technical information. Write for your copy today.

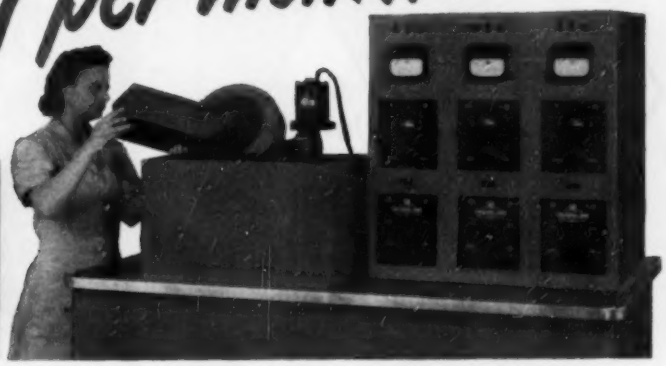
RIVETT

RIVETT LATHE & GRINDER, INC.

BRIGHTON · BOSTON · MASSACHUSETTS · U. S. A.

3,000,000 Dimensions inspected per month!





"Unprecedented savings in cost, quality, and assembly" with this Federal Electronic Sorting Gage.

That's what the owner said — This gage has improved the dimensional quality of chain rivets and has eliminated assembly problems to such a degree that the Assembly Department now refuses to accept rivets until they are inspected by this Automatic Gage. Result — two more Federal Electronic Sorting Gages are on order *right now.*

Thirty years of basic gaging know-how, plus standardized electronic components, put Federal Automatic Gages years ahead in performance. We build these gages to exactly meet your requirements. Our wide experience has served all types of industries. Automatic Gages are controlling the quality of all types of products from rivets to glass tubing, from fountain pens to insulator plates.

Any combination of units is available:—manual loading and disposal, automatic loading and disposal, and combinations of either manual or automatic systems. Electronic Sorting Gages can also be built to fit in your conveyor line—or components can be supplied for you to build into your own system. Other modifications are available for continuous measurement of strip material and for automatic sizing control of machine tools. All these applications are now in successful use.

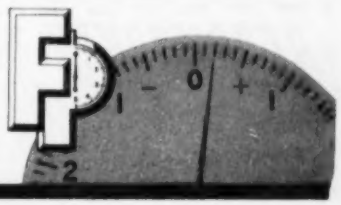
Learn how automatic and semi-automatic gages can be applied to your requirements. Write for more details—and tell us about your own problems. No obligation, of course. Federal Products Corporation, 1121, Eddy Street, Providence 1, R. I.

A FEW OF THE MANY SUCCESSFUL APPLICATIONS OF THIS MODERN GAGING SYSTEM

TYPE OF PART	DIMENSIONS	NUMBER OF SIZE GROUPS	TOLERANCE PER GROUP	PARTS PER HOUR
Disc	Thickness	2 — OK plus too thick or too thin	.0005"	3600
Movement Plate	Depth	4 — two OK plus too deep and too shallow	.002"	3600
Glass Tubing	Size	2 — Good and Bad	.005" to .040"	3600 to 4800
Piston Pin	O.D. over full length — also taper	5 — three OK groups plus over and under sizes	.000067"	3600
Fountain pen barrel	O.D. and length	5 O.D. plus over and under O.D. and length	.002"	3600

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES



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ALL TYPES • ALL MATERIALS
BILGRAM GEAR & MACHINE WORKS
1217 Spring Garden, Philadelphia, Pa.

Die-Making Machines

They save 50% on sawing, filing and lapping operations, easily maintaining .002" limits. Ask for special bulletin—also circulars on Drill Grinders, Point Thinners, Tool and Cutter Grinders, Face Mill Grinders and Tool Bit Grinders.

OLIVER ADRIAN PRODUCTS

Oliver Instrument Co., 1414 Maumee St., Adrian, Mich.

ACROMARKER NAMEPLATE AND PARTS STAMPING

MACHINES COME IN SEVERAL SIZES AND STYLES. CHARACTERS RANGE FROM 1/16" to ¾". HAND, FOOT AND POWER MODELS.

ACROMARK Company

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Want to cut your production costs?

You'll find many ways to do it just by visiting the Tool Engineers'

INDUSTRIAL *Cost-Cutting* EXPOSITION

APRIL 10-14 (inclusive) **PHILADELPHIA, PA.**

TO SAVE YOUR TIME, ON ARRIVAL AT THE EXPOSITION, JUST FILL IN COUPON BELOW AND MAIL

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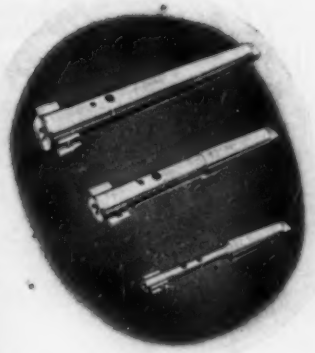
10700 PURITAN AVE., DETROIT 21, MICH.

Please mail me an advance registration form for the Industrial Cost-Cutting Exposition.

Name_____
Title_____
Company_____
Address_____

4 REASONS WHY MADISON REAMERS CUT TIME AND COSTS

The simplified design and operational features of Madison Production Reaming Tools will enable you to cut your reaming time and hole costs to the minimum. Easy to adjust, to maintain and always aligned, the free, smooth cutting action of Madison Reamers has provided the answer to industry's need for greater speed and economy in reaming operations. Check the four reasons for Madison efficiency listed below.

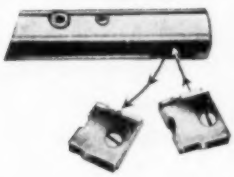


MIRROR-SMOOTH FINISH

The cutting blades of a Madison Reamer produce a mirror-like finish that in most cases does not require an additional finishing operation. Since Madison cutters are pre-sized, any number may be stored in a crib. The Madison one-screw adjustment feature insures that both blades always cut, by eliminating possibility of unequal cutter blade expansion.

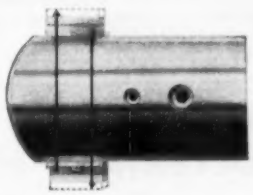
BETTER CHIP CLEARANCE

Because Madison Reamers have no multiple inserted blades, there is more room for chip clearance and circulation of coolant. Thus, danger of clogging and resultant overheating is eliminated, and shrinking or tapering of the hole prevented. Further insurance against hole distortion is provided by Madison's freer cutting action, which permits work to be held very lightly. This makes Madison Reamers ideally suited to the machining of the new, lightweight metals.



INTERCHANGEABILITY

Since Madison cutters are pre-sized, they are interchangeable in Madison bars. A sharp cutter can be inserted in a Madison bar in a matter of seconds without disturbing the original set-up. Keeping a sharp cutter in operation at all times assures more continuously uniform work and the holding of required tolerances. The two-bladed Madison cutter will naturally require less maintenance time.



CONTROLLED FLOAT

Because the Madison cutter is floated in its bar at the exact point where the cutting action takes place, float can be better controlled and indicated for greater uniformity on long-time production jobs. Chances for bell mouth and bar wobbling are eliminated. No special floating tool holders and chucks are necessary.

MADISON
MANUFACTURING COMPANY
DEPT. A-6 MUSKEGON, MICHIGAN

Madisons are used for rigid or float reaming on lathes, drills, millers and special machines. Used on hard and soft metals and plastics. Write for the Madison catalog — lists complete lines, prices and grinding instructions.

Obsolescent Tools Drain Profits!

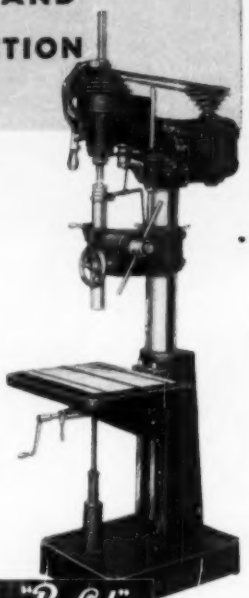
REPLACE WITH MODERN "Buffalo" TOOLS AND WATCH PRODUCTION CLIMB!

● Even the most experienced operator can't do his best on a machine that's old enough to be retired on pension! So why not check to make sure you aren't giving valuable floor space to any tool that isn't "up" to present-day accuracy and high-speed standards? Replacement from the complete line of "Buffalo" metalworking tools will lend new skill and speed to your operators—and give you a new competitive "profit edge." Below are bulletins on "Buffalo" tools that can do it for you. If you drill up to 2" holes in cast iron, you'll get easy, smooth operation with the big, rugged "Buffalo" No. 22 Drill shown at right. WRITE FOR BULLETIN 2989-F.

WRITE FOR YOUR FACTS ON DRILLING

With the "Buffalo" "RPMster," you can change speeds instantly without shutting off the motor. WRITE FOR BULLETIN 3257 and see how this can cut your setup time.

For a rigid, accurate, fast-action drill to handle up to 7/8" holes in cast iron, WRITE FOR BULLETIN 2730-F, on the No. 16 Sensitive Drill.



"Buffalo" METAL WORKING TOOLS

BUFFALO FORGE COMPANY
509 BROADWAY BUFFALO, NEW YORK
Canadian Blower & Forge Co. Ltd., Kitchener, Ont.

How MATERIALS HANDLING Affects Plant Layout

Materials handling is the greatest single item of indirect factory expense in the average metalworking plant. The Special *American Machinist* Report, "How Materials Handling Affects Plant Layout," discusses prime requisites of good layout and effective handling . . . offers selected case histories . . . covers the subject from the standpoint of both entire plants and individual departments.

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How to Use More Color in the Shop for

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Here is a wealth of practical information on the use of Functional Painting. This Special Report's 16 pages . . . illustrated in full color . . . provide you with valuable data on planned color in the shop as an aid to better production.

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McGRAW-HILL BUILDING
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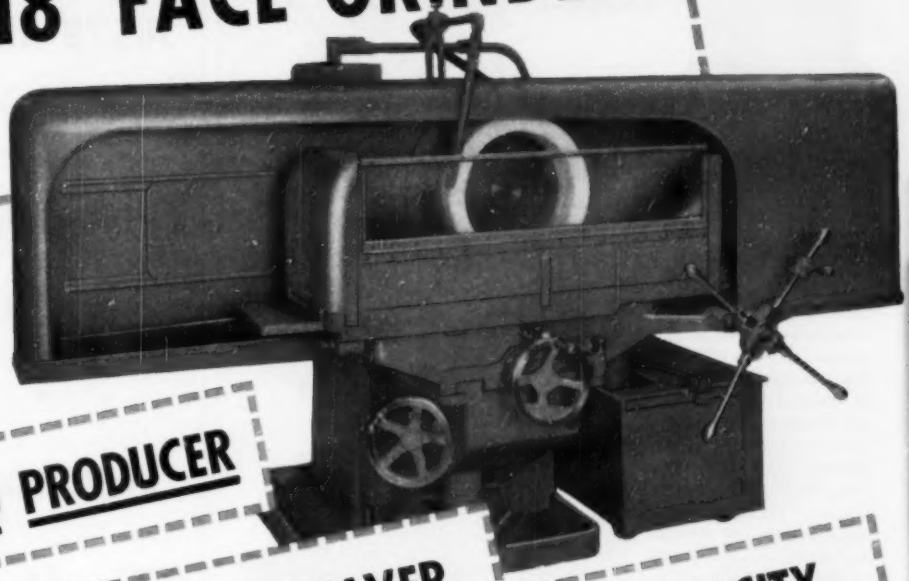
NEW ABRASIVE 18" FACE GRINDER



BIG PRODUCER

BIG TIMESAVER

BIG CAPACITY

Whether you want to face off castings, grind automobile body dies, square die blocks, or do dozens of other jobs the ABRASIVE 18" Face Grinder is a real money maker. It's fast to set up—there's no time lost adjusting stops or gadgets. You can use it for heavy cuts or fine finishing and you get a flat, square surface every time. The 15 h.p. motorized spindle uses no gearing or belting . . . furnishes exceptionally powerful drive where it counts. Hand feed eliminates table overrun, cuts production time. The ABRASIVE 18" handles big work, odd shapes and special fixtures. For complete information and work capacity charts, write **Abrasive Machine Tool Co., 8 Dunellen Road, East Providence 14, Rhode Island**

Important facts you want to know:

Work Table Surface: 13" x 36"
Motorized Spindle: Extra-heavy design with pre-loaded ball bearings; built-in 15 h.p. 900 R.P.M. motor
Wheel Size: Ring-type 18" diam., 4" deep, 2" wall
Feeds: All hand feeds—transv. 3½"; vert. 7¼"; long. 24"
Standard Equipment: Complete wet grinding attachment with 60 gal. tank, motorized pump, unique table water-guards, wrenches, etc.
Net weight: 3900 lbs.

ABRASIVE
ACCURACY BOOSTS PRODUCTION

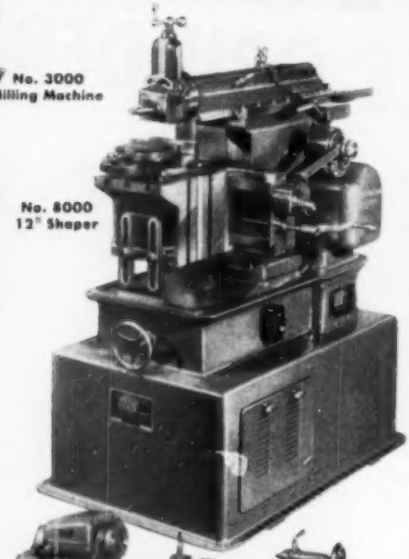
Abrasive Quality is Reflected in the Finish of Your Product

SHELDON

Precision Machine Tools

No. 3000
Milling Machine

No. 8000
12" Shaper

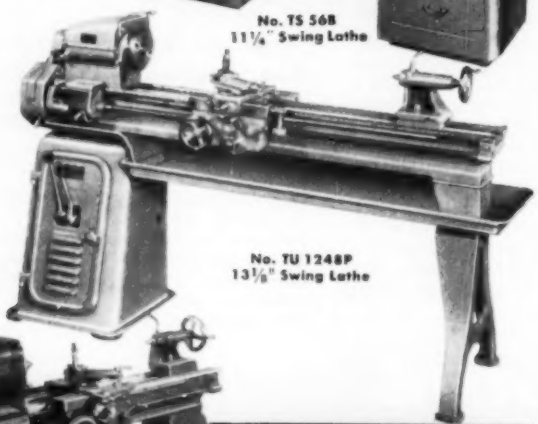


Sheldon Precision Tools are engineered to meet today's demand for moderate priced machine tools that can work to closest tolerances. They are of capacities to meet the everyday demands of the average tool room or shop. They are compact in design and easy to operate. They have the built-in stamina for continuous production operation.

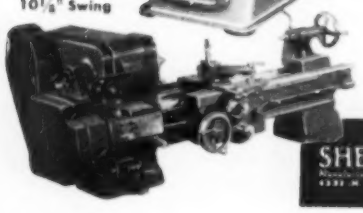
Built by modern methods in a specially tooled, modern machine tool plant, they cost less than other machine tools of comparable quality.

No. TS 568
11¼" Swing Lathe

Write for catalog.



No. TU 1248P
13⅛" Swing Lathe



L44
10⅛" Swing

SHELDON MACHINE CO. Inc
4258 N. KNOX AVENUE • CHICAGO 41, ILLINOIS, U.S.A.

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(Philadelphia April 10-14)

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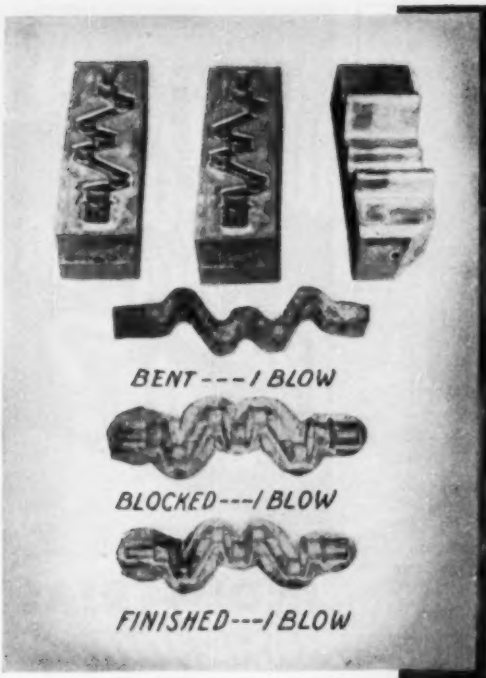
Don't miss . . .

"The Show in Print Section"

of the

April 3rd

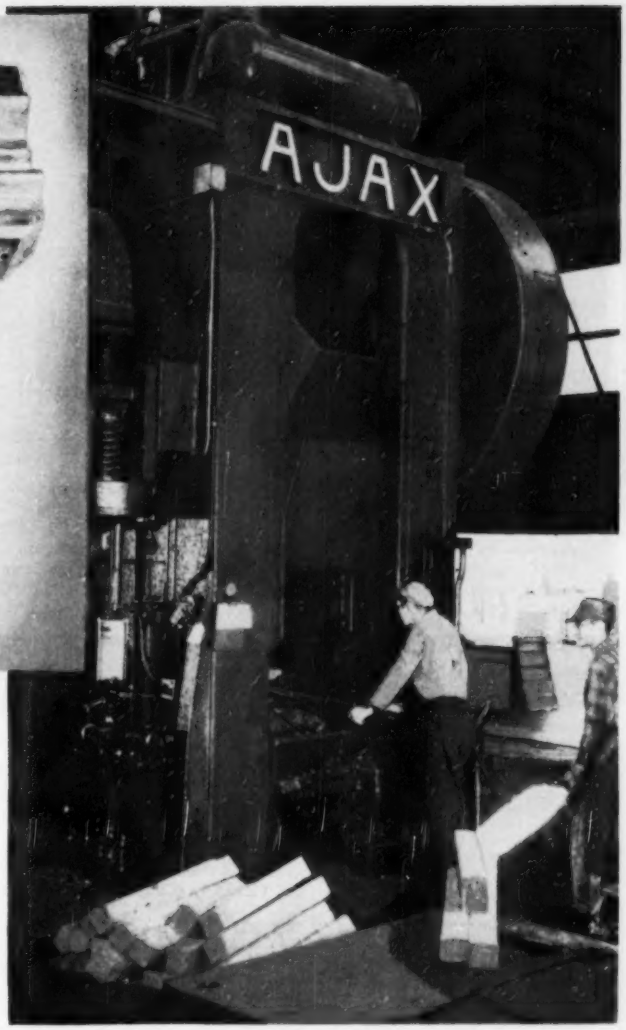
American Machinist



Dies and Forging Operation for Forging Tractor Crankshaft.

INTERNATIONAL HARVESTER COMPANY

PRESS FORGES TRACTOR CRANKSHAFTS



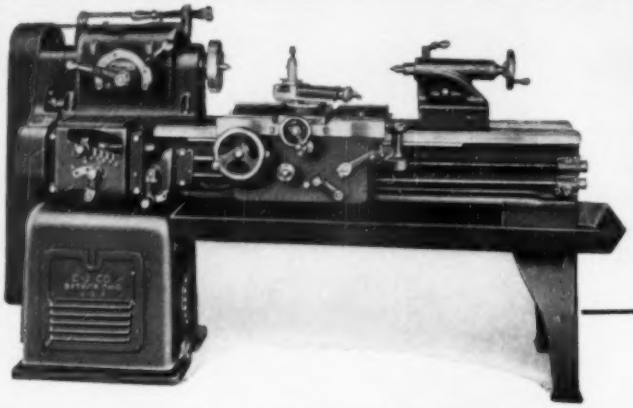
Press Forging Tractor Crankshaft at International Harvester Company, Louisville, Kentucky, Works.

In the Louisville, Kentucky, works of International Harvester Company, tractor crankshafts as well as axles, steering knuckles and gear blanks are being forged on Ajax High Speed Solid Frame Forging Presses. Ajax Forging Presses afford many production advantages not present in other types of presses, such as solid steel frames without tie rods, greater simplicity of operation, lower maintenance, etc.

The same economies which are effected in press forging tractor parts, apply to an extensive list of parts, in many industries, which can be press forged better, faster and at less cost than by any other known method.

Write for Bulletin 75-B

THE Ajax MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND 17, OHIO
110 S. DEARBORN ST. CHICAGO 3, ILLINOIS
DEWART BUILDING NEW LONDON, CONN.



C. & J. Geared Head LATHE 16 INCH 12 SPEED

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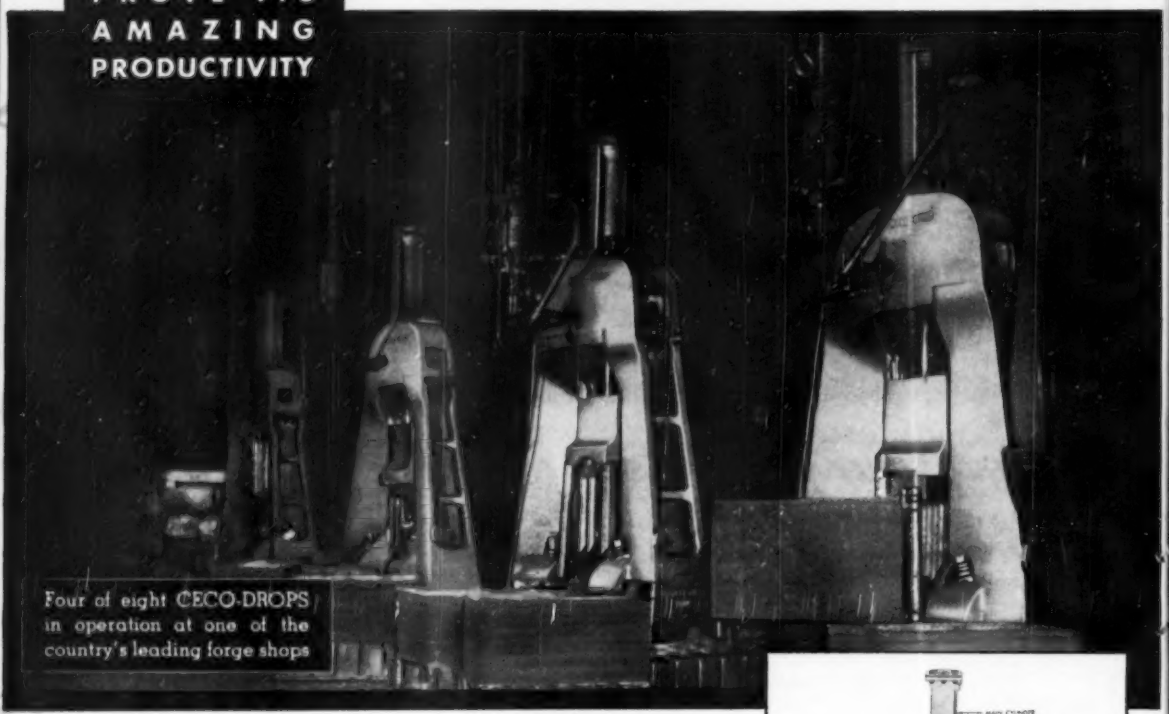
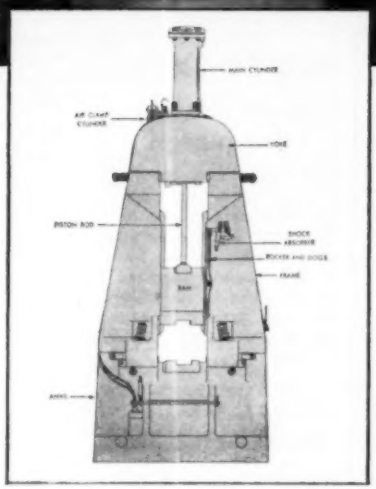


Four of eight CECO-DROPS in operation at one of the country's leading forge shops



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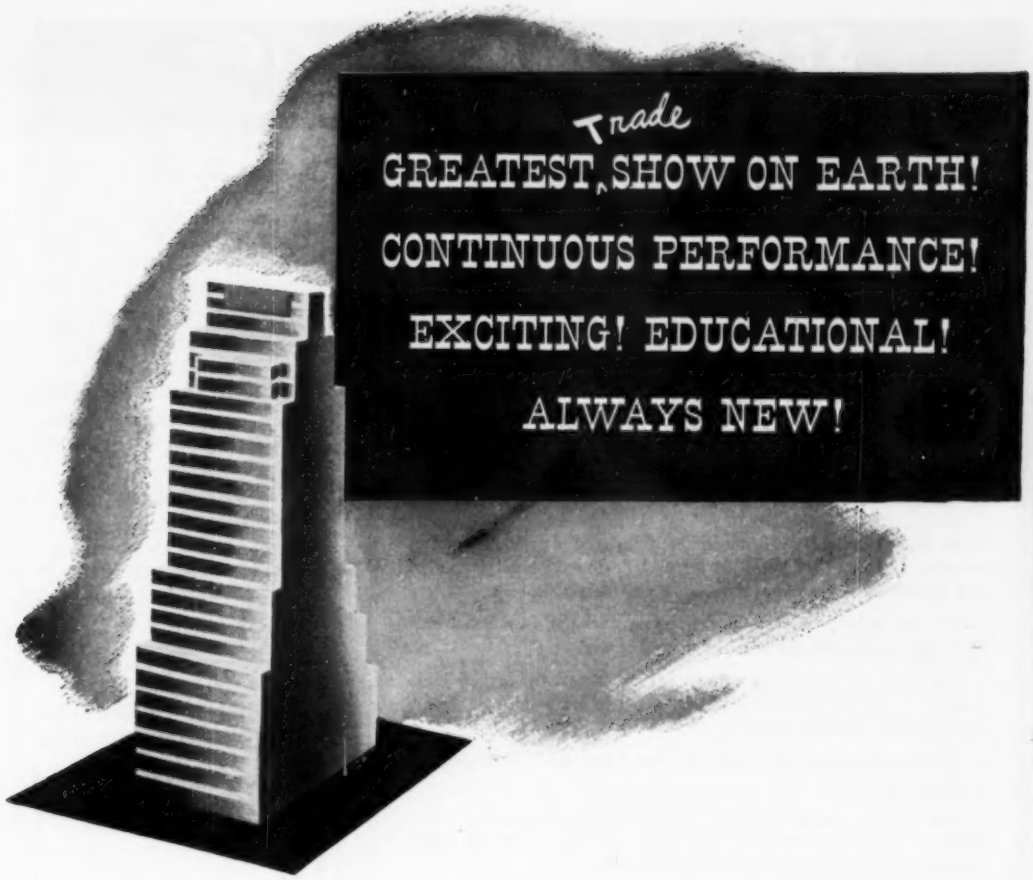

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NEW ADVERTISING received by 10 A. M. January 24th will appear in the issue of February 6th subject to limitation of space available

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MAIN DISTRIBUTORS AND STOCKISTS
for
BROOK POLYPHASE MOTORS

Brook Motors Limited make only alternating current induction motors between 1/6 and 200 horse power and have an annual output of 250,000 motors with a turnover exceeding 10,000,000 dollars.

They are looking for distributors who can stock and market between $250,000 and $1,000,000 worth of motors a year.

They offer a competitive priced, extremely sturdy and reliable product for early delivery. All motors would be made to comply with N.E.M.A. Standards.

Various types of enclosure can be offered and any special requirements incorporated.

They wish to contact a progressive American Company having Technical Engineers and good financial standing to act as MAIN DISTRIBUTORS throughout the United States.

Write immediately to The Managing Director
BROOK MOTORS Limited, Huddersfield, England
giving details or present organization
Personal contact can be arranged

FOR SALE
75 YEAR OLD MANUFACTURING BUSINESS

Catalog items—distributed nationally. Will sell patterns, jigs, fixtures, stock, work in process.

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BO-1801, AMERICAN MACHINIST
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FRANCIS *Metal Products Corporation*
P. O. BOX 155 PALMYRA, N. Y.

WANTED SUPERINTENDENT

Aluminum and zinc die cast plant in Western Michigan employing 75 men. Must be acquainted with die design, production methods and maintenance problems. Give particulars as to age, experience and salary expected.

P1629 AMERICAN MACHINIST
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MATCH PLATE WORK A SPECIALTY
Put your pattern problems up to us—we will take care of them
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ADDITIONAL EMPLOYMENT ADVERTISING ON PAGE 454

ATTENTION MANUFACTURERS

Owner of U.S. Patent on item that can be produced by machine shop, some woodwork, used with fractional electric motor and switch, will sell outright or allow manufacture and selling rights under License. Has large potential market. Only reliable firms with good financial rating considered.

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JANUARY 23, 1950

CATALOG

used and surplus new

MACHINE TOOLS

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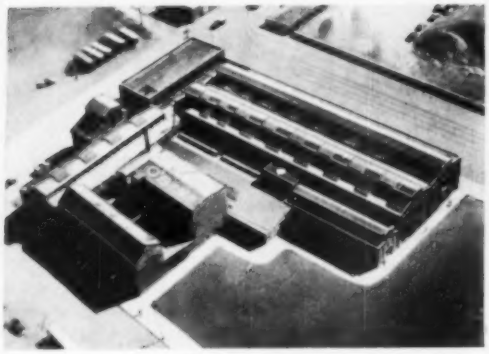

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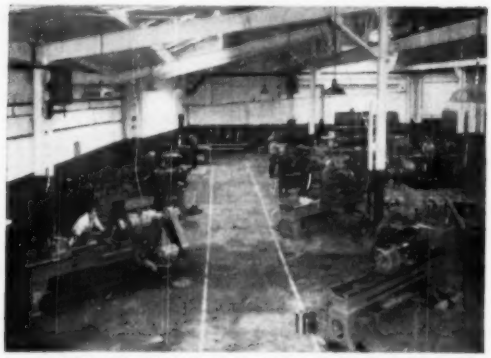
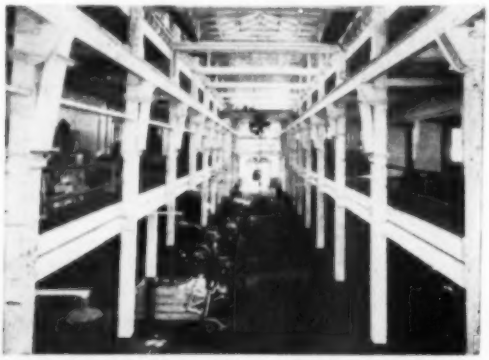


Part of 136' Machine Shop in Production. View Does Not Illustrate Heavy Shop and Assembly Area.



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LATHES

12"x30" ctrs. Monarch Model C Tool Room, AC MD, helical grd., Timken
14"x6' American 12-speed Grd. Hd., AC MD, taper
14"x6' Lodge & Shipley 12-speed Selec. Grd. Hd., AC MD
15"x8' Sebastian Grd. Hd., AC MD
16"x6' Lodge & Shipley 12-speed Selec. Grd. Hd., AC MD, taper
16"x10' American 12-speed Grd. Hd., AC mtr. in leg, taper
17"x8' LeBlond High Duty, AC MD, Berkley drive
18"x10' American High Duty, AC MD
18"x12' Lodge & Shipley Selec. Grd. Hd., AC MD
20"x8' Lodge & Shipley Selec. Grd. Hd., AC MD, taper
20"x12' American 8-speed Grd. Hd., taper
24"x10' American High Duty Grd. Hd., AC MD
24"x12' American Heavy Pat. Grd. Hd., AC MD, taper
24"x14' Lodge & Shipley, AC Turner Uni-Drive, taper
24"x18' American Heavy Pat. Grd. Hd., AC MD, taper
30"x16' Lodge & Shipley, Lima Drive, taper
16"x21" Fay Automatic Lathe, AC MD, new 1943

MILLERS

#1-M Cincinnati Plain, AC MD

#2 Cincinnati High Power Dial Type Universal Miller, AC MD, div. hds., new 1943. Excellent.

#2 Cincinnati H.P. Rect. O/A Plain, AC mtr. in base, Timken
#2-B Heavy Brown & Sharpe Plain, AC MD
#2-B Milwaukee Plain, AC MD, DOA
#2-M Cincinnati Rect. O/A Plain, AC MD
#3 Cincinnati H.P. Plain, AC MD
#3 Van Norman Duplex, AC MD, sub-head
#4 Cincinnati H.P. All-Geared Universal, AC MD, div. hd., vert. hd.
#4-B Brown & Sharpe Plain, AC MD
Type "P" Ohio Heavy Production Miller, AC MD, new 1943
#14 Cochrane-Bly Duplex Univ. Vert. Mill. & Shaper, AC MD
#2 Sundstrand Electro-Mil, new 1943
#2RV Kent-Owens Hand Mill, AC MD, new 1943
6"x84" Pratt & Whitney Thread Mill
BBV2 Hardinge Precision Vert., new 1943

SHAPERS

16" Smith & Mills, cone
20" Gould & Eberhardt Hi Duty, AC Drive-All gearbox drive
20" Queen City, AC Turner Uni-Drive
21" Smith & Mills, back geared, cone
24" American, Back geared, AC MD
24" Gould & Eberhardt High Duty, AC Drive-All gearbox drive

28" Cincinnati Heavy Pattern Crank Shaper, AC MD, helical geared, Timken, power rapid traverse, new 1943. Excellent.

28" American Heavy Pattern, AC MD
28" Columbia Heavy Duty, S.P.D.
32" Gould & Eberhardt "Invincible," AC Western gearbox drive

PLANERS

22"x22"x6' Cincinnati, 1 head, belt drive
28"x28"x6' Cincinnati, AC MD, 1 head, box table, trigger feeds
30"x30"x18' Whitcomb, AC MD, 2 heads
36"x36"x16' Gray, AC MD, 4 heads
36"x36"x18' Gray Extra Heavy Pattern, belt drive, 2 heads
42"x42"x14' Niles-Bement-Pond Heavy Pattern, motor driven, box table, 4 heads

RADIAL DRILLS

4' Morris, AC MD thru Turner Uni-Drive
7' Dreses, AC MD thru factory gearbox

GRINDERS

#2 Cincinnati Universal Tool & Cutter, AC MD, late type
#4 Gallmeyer & Livingston Tool & Cutter, AC MD
#14-WD Hammond Carbide Tool Grinder, AC MD, new 1943
#3 Abrasive 8x22" Surface, AC MD
12"x36" Diamond Surface
#22 Heald Rotary Surface, AC MD, 12" chuck, late type
#25 Heald Rotary Surface, AC MD, 20" chuck
#25A Heald Rotary Surface, AC MD, 27" chuck
10"x24" Landis Type C Hydr. Univ. Grinder, AC MD, internal attach., new 1943
#2 Cincinnati Centerless, AC MD

BORING MILLS

36" Bullard "New Era" Vert. Turret Lathe, AC MD, side head
38-44" Niles-Bement-Pond Vert. Turret Lathe, side head, AC MD
#3A Universal Horz., S.P.D., 3" bar

GEAR MACHINERY

#12H and #18H Gould & Eberhardt Hobbers, AC MD
#4-36", #4-48", #5-48", #6-72" Brown & Sharpe Cutters, AC MD
32"x16" Cincinnati Hobber, 8" dia. hole in work spindle, AC MD
#12 Barber-Colman Spline Hobber, AC MD, DOA, 3⅛" hole

TURRET LATHES

#1-A Warner & Swasey Univ., AC MD, bar feed
#4 Cincinnati-Acme Univ., AC MD, hard. ways, Timken

#4-L Gisholt Heavy Duty Saddle Type Turret Lathe, 25 HP AC motor, 9¼" hollow spindle, hardened ways, *threading attachment*, new 1940. Excellent.

SAWS

8"x9" Model 22C Racine "Shear Cut," AC MD
10"x10" Model 9A Marvel (Armstrong-Blum), auto. bar feed, tracks, etc.
13"x16" Peerless, belt
#1 Ryerson Friction, 25 HP AC MD, 46" blade

PRESS BRAKES

5½' x 16 ga. Verdin-Kappes-Verdin, AC MD

12'x3/16" Cincinnati All-Steel Power Press Brake, AC MD, Excellent condition.

MISCELLANEOUS

#9-SBS Buffalo Bar Shear, AC MD
EF-14 Pels Angle & Bar Shear, AC MD
R-4-P Wiedemann Turret Punch, AC MD
50-ton Henry & Wright Dieing Machine, AC MD, roll feed & scrap cutter
#6 Bliss-Consolidated OBI Press, AC MD
#1 & #2 Baker Keyseaters, AC MD
#203 Chicago 10'x12 ga. Steel Leaf Brake, AC MD
XB-10 Oilgear Twin Ram Broach, AC MD
1½" Landis 2-spindle Bolt Cutter, AC MD
2½" Landis Long Bed Stay Bolt Threader
6" & 10" Pratt & Whitney Vert. Shapers

YOUR INQUIRIES SOLICITED

COX MACHINERY CO., INC.
P. O. Box 1953 CINCINNATI 1, OHIO
OFFICE AND WAREHOUSE: 311-313 Bakewell St., Covington, Kentucky
Three minutes from the Cincinnati hotel district

LATE TYPE MACHINE TOOLS

AUTOMATICS

6" RPA-8 Acme-Gridley Chucker. 1941.
16" Bullard Mult-Au-Matic, 6 & 8 spdl. 1944.
2⅝" RA-6 Acme-Gridley, 6 spindle. 1943.
1⅝" Greenlee, 6 spindle. 1942.
9/16" RA-6 Acme-Gridley. 1942.

BORING MACHINES

No. 42 Lucas Horizontal. 1940.
No. 54 Excello Double End. 1940.
No. 46B Heald Single End. 1940.

DRILLS

3'9" "Mor-Speed". Latest.
25" Fosdick "Economax." 1941.
No. 217 Baker, box column. 1942.
No. 5 BM Fosdick, box column. 1942.

GEAR EQUIPMENT

3" Gleason Generator. 1941.
No. 6 & 17 Gleason Testers. 1943.
12" Red Ring Internal Shaver. Late.
No. GCL Red Ring Shaver. 1942.
No. 624A3 Fellows Side Trimmer. New.
No. 615A & 61A Fellows Shapers. 1943.
No. 7125A & 712 Fellows Shaper. 1943.
Vinco Spline & Gear Grinder. 1942.

GRINDERS, CYLINDRICAL

25" x 48" Landis, Crankshaft. Like New.
16" x 36" Cincinnati Plain. 1942.
12" x 48" Cincinnati Univ. 1943.
10" x 72" Landis Plain. 1942.
10" x 18" Norton Plain. 1942.

GRINDERS, INTERNAL

No. 74 Heald Ext. Bridge. 1941.
No. 72A3 & A5 Heald Plain. 1944.
No. 5 & 16A22 Bryant. Latest.

GRINDERS, SURFACE

No. 18 Blanchard, 36" Chuck. 1942.
12" x 16" x 60" Thompson Hyd. Latest.
No. 22 & 25A Heald Rotary. 1943.

LATHES, ENGINE

45" x 192" Axelson. 1942.
24" x 168" Sidney. 1942.
16" x 54" Lodge & Shipley. 1943.
18" x 48" Bradford. 1942.

LATHES, PRODUCTION

Gisholt "Simplimatic." 1940.
No. 3A L&S "Duomatic." 1943.
No. 2FU Foster "Fastermatic." 1943.
8" x 108" Lo-Swing Semi. Auto. 1942.
Model 8, 10 & 12 Sundstrand. 1942.
14" x 42" Monarch "Magna-Matic." 1941.
20" x 25" Fay Automatic. 1942.

LATHES, TURRET

36" & 42" Bullard Vertical. 1943.
No. 2A & 3A Warner & Swasey. 1943.
No. 1 & 8½" x 24" Acme Univ. 1943.
No. 2, 3 & 4 Warner & Swasey. 1943.
No. 2, 3, 5 & 7 Bardons & Oliver. 1942.

MILLS, PLAIN

No. 5 Cincinnati. 1943.
No. 4H & 4K Milwaukee. 1943.
No. 3B Brown & Sharpe. 1941.
No. 3 Van Norman. 1942.
No. 2HL Milwaukee. 1942.

MILLS, PRODUCTION

BL-2416 P&W "Keller," 1 sp. 1943.
BG-1 Keller, single spdl.
No. 2-20 Kent Owens. 1942.
No. 1224 & 1248 Milwaukee. 1943.
No. 3-36 Cincinnati Duplex, R & F. 1942.
No. 1-18, 2-18 & 2-24 Cincinnati. 1942.

MILLS, THREAD

6" x 60" Pratt & Whitney. Latest.
12" x 54" Lees Bradner. 1943.
4" x 9" Hanson Whitney. Late.

MILLS, UNIVERSAL

No. 2MH Cincinnati. 1942.
No. 2H Milwaukee. 1942.
No. 2SU & 26SU Van Norman. 1942.

MILLS, VERTICAL

No. 3B P&W Univ. Die Sinker. 1943.
No. 2K & 3H Milwaukee. 1942.
No. 2 & 3 Cincinnati. 1942.
No. 1 Cleveland. 1942.

PRESSES

No. 40-5½ Minster. 1942.
100 Ton Hamilfin, Hyd. Str. 1942.
50 Ton Denison. Hyd. Str. 1942.

INDIANAPOLIS MACHINERY & SUPPLY CO.
1961 S. Meridian St.
INDIANAPOLIS 6, IND.

BUY FROM STOCK
Telephone
MAIN 6347-6348

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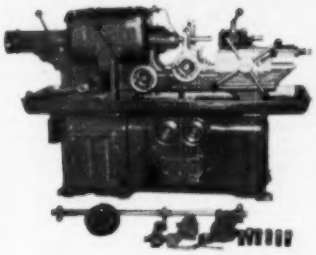


Simmons #2B, Geared Hd. Dial Type, Bar Feed 'Micro-Speed' Turret Lathe. 1¼" Capacity. Coolant System, Collets & Tooling.

TURRET LATHES

Bardons & Oliver #1 Electric Turret Lathe. ¾" cap. Has bar feed & collets.
Morey #2 Geared Head 1" Cap., M. Dr.
Simmons Microspeed 1" Cap., M. Dr.
W-Swasey #4 Univ. 1½" cap., M. Dr.
Jones & Lamson #3 Univ. Bar Feed 1½".
W-Swasey #3 Univ. 1½" cap., M. Dr.
Bardons & Oliver #7, Univ. 2½" Cap.
W-Swasey #3A Univ. 3½" cap., M. Dr.
Warner & Swasey #1A Universal Heavy Duty Saddle Type Turret Lathe. Serial #648220. Capacity —2½" rd., Gr. Hd. 12 speeds. Coolant system, bar feed, chuck & tooling. Immediate delivery.

Leach 6"x12" Horizontal Surface Grinder. NEW. 2-Speed Ball-Bearing Spindle. Motor in cabinet base. Immediate delivery from stock.

LATHES

36"x30' LeBlond Q.C.G. Hvy. Duty Grd. Hd.
26"x14' Lodge & Shipley Q.C.G. Taper.
25"x14' LeBlond, Taper Att. Motorized.
24"x16' American, 11' C.C. Taper Att.
24"x8' Lodge & Shipley, Q.C.G. Motorized.
22"-46"x10' Q.C.G. Putnam Extension Bed Gap.
22"x10' LeBlond, Q.C.G. Motorized.
20"x18' American Q.C.G. Grd. Hd. Taper Att.
20"x10' Hendey Q.C.G. Taper Att. Motorized.
20"x10' American, Q.C.G. Motorized.
18"x8' Hendey, Q.C.G. Motorized
18"x6' American Q.C.G. Grd. Hd. Taper Att.
18"x6' Monarch Q.C.G. Grd. Hd. Motorized.
16"x8' Hendey Q.C.G. Taper Att. Motorized.
14½"x6' South Bend Enclosed Head, Motor Driven.
14"x8' Hendey, Q.C.G. Taper Att. Motorized.
14"x8' Reed-Prentice Grd. Hd. (REBUILT)
14"x7' Hendey Q.C.G. Motorized.
14"x6' Hendey Q.C.G. Taper Att. Motorized.
12"x6' Hendey Q.C.G. Taper Att. & Equipment.
12"x5' Hendey Q.C.G. Taper Att. & Collets.
11"x3' South Bend, Q.C.G. Motorized.
10"x24" Logan Q.C.G. #825—(NEW)
10"x24" Logan Q.C.G. #820—(NEW)
9"x15" Porter-Cable Grd. Hd.

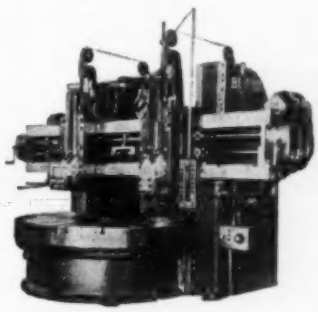
GRINDING MACHINES

Cincinnati 6"x18" Hydraulic Cylindrical. FILMATIC BEARINGS. Built-in Controls.
Cincinnati 10"x36" Plain Hydraulic Cylindrical Model #EA. Serial #5P2D1L-19. Filmatic Bearings. Built-in Electrics. Hydraulic Infeed.

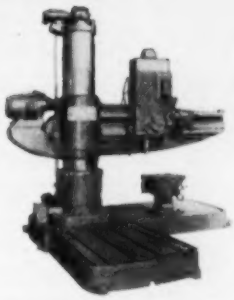
Cincinnati #2 Cutter & Tool Grinder. New in 1943, Equipment includes Motor Driven Cylindrical Grinding Attachment.

BORING MILLS

3¼" bar Giddings & L. Horiz.
5" bar Barrett #2 Cylinder. Boring.
8" bar Barrett #6 Cylinder. Boring.
Ryerson #11 Horiz. 3" Capacity, #6 M.T.
24" Bullard Vertical, Motorized.
42" Bullard Vertical, Motorized.
54" Bullard Vertical, Motorized.
42" Gisholt Vertical, Motorized.



Betts 100" Vertical Boring & Turning Mill. 1944 machine. 2 plain heads. Complete Electrical Equipment. Excellent condition.



Cincinnati-Bickford 6'-19" SUPER-SERVICE Radial Drill. New in '42. Standard base plus angle base. 36 spindle speeds. Necessary motors & controls.

RADIAL DRILLS

Cinci-Bickford 6' Arm, 15" Col. 24 Speeds.
Cinci-Bickford 5' Arm, 13" Col. 24 Speeds.
Cinci-Bickford 4' Arm, 13" Col. 32 Speeds.
Cinci-Bickford 3' Arm, 9" Col. 12 Speeds.

Van Norman #3V Ram Type Vertical Mill. Late Type. 18 speeds. Range: 34"x12"x 18". 14" ram travel. Power Rapid Traverse.

MILLING MACHINES

Milwaukee #2B Dble. Overarm, Horiz.
#3 Dial Type, H.S. Cincinnati Vertical Mill.
#2, #3, #4 Cincinnati High Power Vert.
#4-36 Cincinnati 4-Spdle. Duplex Hydromatic.
#4-36 Cincinnati Plain Hydromatic.
Sundstrand #0 Hydraulic Feed Rigidmill.
Cincinnati #0-8 Automatic Horizontal.
Cincinnati #0-8 Vertical.
Cincinnati #2-18 Automatic Horizontal.
Brown & Sharpe #12 (Electrics Built-in) 24".
Nichols Hand Mills (Late Type).

UNIVERSAL MILLING MACHINES

B & S #2, 20"x5"x17½".
B & S #1½, 28"x7"x18".
Bridgeport, 20"x9"x16" Turret Type.
Garvin #2MU, 24"x8"x18".
Kempsmith #2, 28"x8½"x18".
Cincinnati #2M, 28"x10"x18".
B & S #3, 34"x10"x21".
Cincinnati #35 34"x12"x20".

PUNCH PRESSES

O.B.I. Toledo #5, 44 tons cap. motor dr.
O.B.I. Bliss #18, 19C, 20, 20B, 21 motorized.
O.B.I. Michigan, 36 tons cap. Wide ram & bed.
#68C Bliss Dble. Action 3-Crank.
#91C Toledo Sgle. Act. Dble. Crank S.S.
#305 Bliss S.S.S.A. 95 tons Cap.
#3A Bliss S.A.S.S. Dble. Crank. 42 Tons.
Zeh & Hahneman 35 Tons S.A. Cam Release Spring Return. 220/440 motor.

NEW 60 PAGE CATALOG MAILED FREE UPON REQUEST

SPECIAL OFFERINGS . . . . AT PUBLISHED PRICES

IN STOCK FOR IMMEDIATE SHIPMENT

Model 2150 Defiance Hydraulic Horizontal Boring, Drilling, and Milling Machine, table type, diameter of spindle 5", Morse Taper No. 6, table size 48"x84", with 15 HP Motor, quick change feeds and speeds, Serial No. 1606-42, Mfg. in 1942. PRICE $17,500.00

(Will Trade For Old Style Cone Driven Machines)

2—HYDE PARK 156"x½" POWER GAP SQUARING SHEARS, BACK GEARED, WITH EXTRA BLADES, 15 HP AC MOTOR, EXCELLENT CONDITION ..... $4,750.00 ea.

AMERICAN RING METAL TURNINGS CRUSHER, MACHINE NO. 2400, CAPACITY 2½ TO 3½ TONS PER HOUR. LATE TYPE $1,500.00

LEBLOND 28" SWING x 8' CENTERS GEARED HEAD HEAVY DUTY ENGINE LATHE, SERIAL NO. 9H1807 WITH TAPER ATTACHMENT, AND EQUIPMENT. LATE TYPE $7,500.00

RAS ACME GRIDLEY 9/16" AUTOMATIC SCREW MACHINE MFG. 1943 ..... $2,750.00

NO. 98 CINCINNATI HORIZONTAL & VERTICAL MILLS (4 ea.) LATE TYPE ..... $750.00 ea.

2—ALLEN FOUR SPINDLE DRILL PRESSES, TYPE KH, #2 MORSE TAPER, COMPLETE WITH ALL MOTORS, ETC. LATE TYPE ..... $1,250.00 ea.

2—23-R GISHOLT SADDLE TYPE TURRET LATHES, 28" SWING, 5¼" HOLE IN SPINDLE, QUANTITY OF TOOLING, SER. #2927-31 & 26. LATE ..... $2,500.00 ea.

BAUSH HORIZONTAL DEEP HOLE DRILL, SERIAL #5171, RIFLE BARRELING MACHINE, DOUBLE END, 6½" SWING 6' 4" CENTERS. LATE $1,500.00

WALTHAM AUTOMATIC THREAD MILLER, 3"x12", SERIAL NO. 467, WITH FEED GEARS, LATE $850.00

CANEDY-OTTO 5' 12" COLUMN RADIAL DRILL, SERIAL NO. T549, WITH 2 HP MOTOR ON SPINDLE, AUXILIARY TABLE, EQUAL TO NEW $2,750.00

2—BIRDSBORO 156"x½" POWER GAP SQUARING SHEARS, BACK GEARED, WITH EXTRA BLADES, 15 HP AC MOTOR, EXCELLENT CONDITION ..... $6,000.00 ea.

#70½B BLISS OPEN BACK GAP FRAME PRESS, STRAIGHT SIDE, 175 TON CAPACITY, 6" STROKE SERIAL NO. 71387 ..... $3,750.00

MONARCH TOOLROOM LATHES (2), 14" SWING x 36" CENTERS, SERIAL NOS. 16699 AND 24350, WITH EQUIPMENT, EXCELLENT MECHANICAL CONDITION ..... $3,250.00 ea.

LAKE ERIE HORIZONTAL C FRAME PRESS, 50 TON SERIAL #2064, LATE TYPE $1,000.00

MODEL 213 CAMPBELL HYDRAULIC ABRASIVE CUTTING MACHINE, SERIAL #637, LATE $500.00

20" GEMCO SHAPER, WITH 12" VISE, SERIAL NO. 5649, MFG. IN 1946, EXCELLENT MECHANICAL CONDITION $2,750.00

#4 GISHOLT RAM TYPE TURRET LATHE, WITH PRESELECTOR HEAD, QUANTITY OF EQUIPMENT, SERIAL NO. 730-17, MFG. IN 1941 ..... $2,500.00

CINCINNATI #34-36 PLAIN TRACER CONTROLLED HYDROMATIC MILLING MACHINE, SERIAL NO. 4B33PIP-3, MFG. 1944 ..... $3,500.00

AMERICAN HYDRAULIC VERTICAL BROACH, 15 TON CAP., 60" STROKE $1500.00

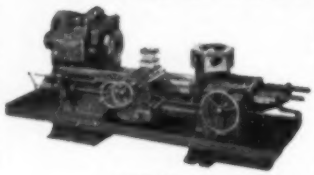
INDUSTRIAL CHILLING MACHINE, NEW, 120° F. 87"x32½"x38" H., APPROX. 7½ CU. FT. TWO MOTORS. NEVER USED $850.00

INSPECTION IN OUR WAREHOUSE

WINSTON MACHINERY COMPANY, INC.

517 SOUTH DELAWARE STREET, INDIANAPOLIS 4, INDIANA

GUARANTEED TOOLS



LATHES

14"x6' LODGE & SHIPLEY, motor in base, collets, chuck

16"x34" LE BLOND Toolroom, taper, chucks, collets, AC motor, 1942

18"x48" SIDNEY Monotrol, Timken spindle

20"x62" AMERICAN 12 Speed Geared Head, Timken spindle, taper

20"x96" AMERICAN, Timken spindle, taper, rapid traverse, serial over 60,000

30"x12' cc NILES "Timesaver", Timken spindle, AC motor, 1942

36"x13' cc AMERICAN High Duty, 1942

36"x25' cc NILES Heavy Duty, 2 carriages, 1942

48"x20' cc BETTS BRIDGEFORD, rapid traverse, 1941

48"x20' cc DRIGGS (NEW HAVEN) Geared Head

TURRET LATHES

No. 3 BARDONS & OLIVER, bar feed, 1943

No. 2A, 3A and 4A WARNER & SWASEYS, late type, with full tooling (see photo)

No. 4H LIGBY, cross sliding turret, 12" hole in spindle, 1943

No. 4F FOSTER Fastermatic, with tooling, 1942

MILLING MACHINES

No. 2K—K. & T. Universal

No. 3 CINCINNATI Plain, dial type, 1942

No. 3K—K. & T. Vertical, dial feeds and speeds, rapid traverse

No. 5 CINCINNATI High Power, Plain, 1942

BORING MILLS

24"—16"—42" BULLARDS, Vertical

53" NILES BEMENT POND, 2 swivel heads, rapid traverse, MD

84" CONSOLIDATED COLBURN, 2 swivel heads, rapid traverse, AC—MD

No. 32 LUCAS Horizontal, 3½" bar

RADIAL DRILLS

4' HAMMOND Jacknife, 1942

4'-11" CARLTON, No. 4 Morse taper, box table

5'-11" CARLTON, arm extended to 7'

3'-11" AMERICAN Helewizard

GRINDERS

20"x96" NORTON Plain, all AC motors

24"x192" NORTON Plain Cylindrical, AC motors, new 1943, equal to new condition

No. 2 CINCINNATI Tool & Cutter

MISCELLANEOUS

16" GOULD & EBERHARDT High Duty Shaper

24" HENDEY Universal Shaper

1½" to 6" WILLIAMS Pipe Threader, chasers, MD

1½" to 8" WILLIAMS Pipe Threader, chasers, MD

50 ton HENRY & WRIGHT Dieing Machine, double roll feed, scrap cutter, MD

60"x48"x12' LIBERTY, box table, rapid traverse, 3 heads, AC—MD

WRITE TO—

O'CONNELL MACHINERY CO.
1825 NIAGARA ST. BUFFALO 7, N.Y.

PROMPT DELIVERY

UNUSUAL VALUES

Milling Machines—No. 1 Universal, No. 1 American (new) plain, No. 1 Vertical.

Drills—Large selection, single and multiple spindles also bench types, many of them new.

Gear Cutters—Brown & Sharpe No. 3—26" Gould & Eberhardt 42".

Grinders—Cylindrical B & S No. 11, Planer type 10"x36" Surface 12"x62", also new (small) Universal bench and floor type. All with coolant, motorized.

Lathes—14"x6', 8', 10'—16"x6', 8', 10'—20"x10'—all cone drive, several motorized also (new) 18"x8' and 10' geared head, motorized.
Large stock 10" and 13" bench and floor type.

Planers—Single head 24"x8', 24"x9', 28"x8'.

Shapers—16", 20", 24" B.G. crank.

Turret Lathes—J & L 2"x24"—3"x36" also Acme, W & S Turret (vertical) boring and facing mills, 5 hole turrets, 30", 40".

SPECIAL—New totally enclosed dust proof, fan cooled ball bearing saw arbor motors, plain shafts to size or threaded, and with collars, measures only 3¼" from center of shaft to flatted top (1 h.p. to 15 h.p.) 2 or 3 phase, 3600 r.p.m.

WOOD WORKING MACHINERY—A very large stock of new and re-built, practically all motorized. New Motorized overhead cut-off and miter saw for wood, plastics, steel, aluminum and other metals. The above list is only a fraction of our stock which changes almost daily, therefore, tell us definitely what you want since we are adding considerable number of machines to our stock which are too many to list. What we have today may be sold tomorrow, so a list is really not dependable.

Drill—Foote-Burt No. 25 24" Hi Duty 2" capacity in steel. Motor attached.

PATTERN MAKING MACHINERY—42"x16' bed wood lathe, compound rest, rack and pinion feed to carriage; 16" heavy duty jointer extra long bed, front table tilts for giving draft to pattern work; tilting table also tilting arbor rip and cut-off saws; band saws; jointer; floor and bench type trimmers; and also many other machines for pattern work.

THE OSBORNE & SEXTON MACHINERY CO.

P. O. Box 88, Columbus 16, Ohio

LATEST TYPE *Nearly New* MACHINES

BORING MILLS—Horizontal
CINCINNATI GILBERT 3¼" bar, Floor Type, latest
DETRICK & HARVEY 4" bar, Floor Type, latest Type
GIDDINGS & LEWIS #20T, 1¼" bar, Floor Type, latest
HEALD 68, 49 single end, Pneumatic, Latest
LANDIS—3½" bar, Floor type, M.D.
LUCAS #41, 3" bar, Table Type, Latest Type
LUCAS #43, 5" bar, Table Type, Late Type
NILES-BEMENT-POND 5", 8" bar, Floor Type, M.D.
UNIVERSAL 3" bar, high speed, latest Type

BORING MILLS—Vertical
BULLARD 10" 6-spindle Mult-Au-Matic Type D, Latest
BULLARD 12" 6-spindle Mult-Au-Matic Type D, Latest
BULLARD 72" 36" Turret "New Era" Side Head, M.D.
BULLARD 84" 36" 42" Vert. Turret "Spiral Drive".
High Speed, Latest Type
COLBURN 72", 2 swivel heads, PRT, M.D.
KING 62", 2 swivel heads, Rapid Traverse, AC M.D.
NILES 100", 2 swivel heads, Rapid Traverse, AC M.D.

BROACHES
AMERICAN V-2, 6 ton Hyd., Latest Type
CINCINNATI 1-20, 2-30, Duplex Vertical Surface,
Hyd., Double Ram, Model ER, Latest Type
LaPOINTE 8-36 Vertical, Hyd., Latest Type

DRILLS—Miscellaneous
BARNES H-3 "Hydram," Hydraulic, 3" capacity—for inverted drilling, Latest Type
CINCINNATI BICKFORD 24" Box Column, Latest
CINCINNATI BICKFORD #1LMB, 4 Spindle, Latest Type
LELAND & GIFFORD #1LMB, 4 Spindle, Latest Type
LELAND & GIFFORD —2 —2MB, Single Spdle,
LELAND & GIFFORD #2LMS 3 and 6 spindle, Latest
LELAND & GIFFORD #2MB, Single Spdle,
NATCO #4AL Multiple, 30 spindles, Hyd., Latest Type

DRILLS—Deep Hole
BARNES 420/3 Spindle Hydraulic, Latest Type
LeBLOND #3 Single Spindle, Hydraulic, Latest Type
PRATT & WHITNEY #1Ba50", Hyd., Latest Type

DRILLS—Radial
AMERICAN 4' arm 11" col. "Hole Wizard," Latest
AMERICAN 4' plain Triple Purpose, Motor Drive
AMERICAN 5' arm, 13" column Plain, M.D.
AMERICAN BICKFORD 5'13" Column, Plain, M.D.
CINCINNATI BICKFORD 6' arm 15 col. Plain or Univ., M.D.
CIN. BICKFORD 6' arm Column Univ., M.D.
DREMER 5' arm 12" column Univ., M.D.
WESTERN 6' arm 20" column Plain, Latest Type

GEAR CUTTING EQUIPMENT
BARBER COLMAN #13 Hobber, Single and Double Overarm, Motor Drive
BROWN & SHARPE 6-48 Gear Cutter, Motor Drive
BROWN & SHARPE #13 Spur and Bevel Cutter, M.D.
BROWN & SHARPE Machine, Motor Drive
CROSS #1 Tooth Rounding Machine, Latest Type
CROSS #50 Universal Gear Chamfer, Latest Type
FELLOWS GL 614, 622, Model Z, 7A, 7, 72, 72S, 77
High Speed Gear Shaper, Latest Type
FELLOWS #12M Involute Measuring Instrument, latest
FELLOWS #12LE Lapper, latest type
FELLOWS 6M Rod Liner, Latest Type
GLEASON #14 Hypoid Spiral Generator, latest type
GLEASON 20" 15° straight bevel generator, latest type
GLEASON #1, #2, #16 Bevel and Hypoid Tester
GLEASON #4, #7, #9 Straight and Revel Gear Planer, Motor drive
GLEASURFACER 34", 77", 90" Straight and Revel Gear
GOULD & EBERHARDT 12H Hobber, Latest Type
GOULD & EBERHARDT 96H Hobber, with diff. M.D.
PRATT & WHITNEY 16" Grinder, hyd., latest
SCHUCHARDT & SCHUTTE #1 Hobber, Motor Drive

GRINDERS—Cyl.—Plain & Univ.
BROWN & SHARPE #1, 2, 2, 4, Universal, Latest
BROWN & SHARPE #5 Plain, 3 x 12, Latest Type
BROWN & SHARPE #5 Plain Hyd., Latest Type
LANDIS 4x12, Type H, Plain Hyd., Latest Type
LANDIS 6"x18" Type C Plain, Hyd., Latest Type C.
NORTON 6"x18", 6"x30", 14"x36", 16"x72" Type C. Plain, Latest Type

GRINDERS—Miscellaneous
BARBER COLMAN #3, #4 Hob Sharpener, Latest
BROWN & SHARPE No. 13 Univ. Cutter & Tool, Lat.
BRYANT #16-CP-16, #34—30", Internal, Hyd., Latest
CINCINNATI #3, #4, Centerless "Filmatic", Latest
CINCINNATI "Monomet" Tool & Cutter, Latest
CINCINNATI "Monomet" Spline, hydraulic, latest
FITCHBURG 14"x20" Spline, hydraulic, latest
GARDNER 24-52" Disc Grinder, Latest
GLEASON #13 tool sharpener, Latest Type
GLEASON #13 "Gagematic" Internal, Latest
HEALD 78A3, 78A8 "Gagematic" Internal, latest
HEALD 78A, 78A3, 78A5, 74, 70A Internal, latest
HEALD #81 Internal Centerless, Latest Type
JONES & LAMSON 6x15, 8x18 Auto Thread, latest
JONES & LAMSON 6x24 Thread, latest Type
LANDIS #6, 6x24 Centerless, Hydraulic, Latest Type
LANDIS #13 Centerless, Hydraulic, Latest
LA POINTE 60" Universal Broach Sharpener, Latest Type
THOMPSON 6"x48" Auto., round broach, M.D.
VAN NORMAN #678, #630, #630, #73 Oscillating
VAN NORMAN Radius Grinder, Latest Type
VAN NORMAN #666 Crankshaft ReGrinder, Latest

GRINDERS—Surface
BLANCHARD #11, 16" dia. mag. chuck, Latest
DO-ALL Model G-7, 9"x20", Hyd., Latest Type
BLANCHARD 16A Vertical, Dial Feed, Motor Drive
BLANCHARD Series 300 12"x18" Vert. Hyd., Latest
HANCHETT Series 300 12"x18" Vert. Hyd., Latest
HANCHETT #36 Vert., 36" dia. mag. chuck, Latest
HANCHETT #120, 30x120" Plano, Hyd., Horiz., Latest
HANCHETT #122, 12" chuck, latest type
HEALD #23 Rotary, 12" and 20" chuck, Hyd., Latest
HEALD #5A—rotary—18" and 30" chuck, Hyd., Latest
NORTON 6x18 Hydraulic, latest type
THOMPSON 12x12x24 Type D Hyd., Latest Type

JIG BORERS
KEARNEY & TRECKER Model B, Autometric, Latest
PRATT & WHITNEY 1A, Motor Drive
SWISS #4 Precision, Motor Drive

LATHES—Engine and Mtg.
AMERICAN 26"x360" centers, 2 carriages, motor drive
BRIDGEPORT 26"x32" bed—2 carriages, M.D.
HENDEY 12x30", 14x30", Timken, Latest Type
JONES & LAMSON —24" 22x30", 24x24 autom., latest
LeBLOND 21"x60" Centers, Geared, Motor Drive
LeBLOND 21"x60" centers, TIMKEN, latest type
LEHMANN 14x30" centers, TIMKEN, Latest
LODGE & SHIPLEY 16"x30", 14"x30", Timken, Latest
LODGE & SHIPLEY 18x72 centers, M.D.
LODGE & SHIPLEY 18x72 centers, 42x108, 52x24, Latest
LoSWING 42x60, 42x96, 42x108, 52x24, Latest
MONARCH 16"x30" centers, Model CKK, Timken, lat.
MONARCH 12"x30" Centers, Model CK, Timken, latest
MONARCH 12"x30" Centers, Model CW, Latest
MONARCH 16"x72" Centers, Model 2 Carriages, Timken Bearing, Model CM, Motor Drive
MONARCH 24"x25" 16H Bearing, Geared Head, M.D.
NILES 20"x30" Boring "Time saver" Timken, Latest
PRATT & WHITNEY 16"x30" Centers, Timken, Latest
PRATT & WHITNEY 10"x30" centers, Bench, latest
PRATT & WHITNEY 10"x30" Centers, Model A, Latest
PUTNAM 42"x36" Centers, Model A, Latest
REED PRENTICE 20"x54" Centers, Timken, latest type
SPRINGFIELD 16"x30" centers, Timken, latest type
WARD, HAGGAS & SMITH—18/20x60" centers gap motor drive, Latest Type

LATHES—Hob and Cutter Relieving
MICHIGAN 1708 Universal, Latest Type
MICHIGAN 1718 Universal, Latest Type
U. S. TOOL #810B, Latest Type

LATHES—Turret
BARDONS & OLIVER #5, #7, TIMKEN, Latest Type
CINCINNATI ACME No. 1 Timken, Latest
CINCINNATI #4FU "Fastermatic," Timken, Latest
FOSTER #4FU "Fastermatic," Timken, Latest
GISHOLT #1L, #2L, #3L, TIMKEN, Latest Type
GISHOLT #3, #4 Univ., Timken, Latest
GISHOLT #3, #5 Univ., Timken, Latest
JONES & LAMSON #3, #5 Univ., Timken, Latest
LIBBY "International" 11H Univ., Timken Bearing, latest
MOREY No. 20, No. 4, Timken Bearing, latest
POTTER & JOHNSTON #5D2B, Timken, Latest
WARNER & SWASEY #3, Universal, Timken Bearing
WARNER & SWASEY #3, #3, Timken, Latest type
WARNER & SWASEY #3, #3, Timken, M.D.
WARNER & SWASEY #3A, Univ., Timken, Bear-
WARNER & SWASEY 3A Universal, Timken, Latest Type
WARNER & SWASEY 3A Universal, Timken Bearing, "Pro-selector" Bar and Chucking, Latest Type
WARNER & SWASEY 3A Universal, Timken Bearing, Bar and Chucking, Latest Type

MILLING MACHINES—Mfg.
HALL Style L, Planetary, latest type
INGERSOLL 42"x36"x12" adj. rail, 4 heads, AC, M.D.
INGERSOLL 32x24x12" adj. rail slab, M.D.
INGERSOLL 30x24x12" adj. rail 2 hd., Latest
SUNDSTRAND Model 3A Duplex 42" feed, Latest
TAYLOR & FENN M80 Duplex Spline, latest

MILLING MACHINES—Plain
BROWN & SHARPE #2, Light Type, Timken, Latest
BROWN & SHARPE #12, 24" feed, Latest
BROWN & SHARPE #00, Timken, Latest Type
BROWN & SHARPE #2B, 2B, Timken, Latest Type
BROWN & SHARPE #2B, 2B, Timken, Latest Type
CINCINNATI 0-8, 1-12, 2-18, Automatic, Latest Type
CINCINNATI #3, #4, #5 High Power, Latest Type
CINCINNATI 4-36 Hydromatic, Simplex, Latest Type
KEARNEY & TRECKER #2H, 3H, 4H, 8H, Latest
KEARNEY & TRECKER 1218, 1404, Simplex, Latest
KEARNEY & TRECKER #3, #4, Timken, Latest Type
KEMPSMITH #30, #4, Timken, Latest Type
KEARNEY & TRECKER 4K, Timken Bearing, Late

MILLING MACHINES—Thread
LEES BRADNER Model LT, 6"x36" Centers, Latest
LEES BRADNER Model HT, 12"x36" Centers, Latest
MOREY 12x36", 60", 120", 180" centers, Latest Type

MILLING MACHINES—Universal
BROWN & SHARPE No. 2A, Timken Bearing, Latest
BROWN & SHARPE No. 3A, 4A, Motor Drive
KEARNEY & TRECKER 2H, Timken, Latest Type
KEARNEY & TRECKER #3K, Timken, latest type
KEMPSMITH #4 Maxi-miller, Timken, latest type
VAN NORMAN #23 duplex, Motor Drive
VAN NORMAN #18, #26, #36, Timken, Latest Type

MILLING MACHINES—Vertical
BROWN & SHARPE #2 Standard Timken, Latest
CINCINNATI #4, Dial Type, High Speed, Latest
CINCINNATI #4, Dial Type, Timken, Latest
CINCINNATI #5B, TIMKEN, Latest Type
CINCINNATI #5B, Super Service, Latest Type
GORTON 8D, 8½D, Timken, Latest Type
KEARNEY & TRECKER 2H, 3H, Timken, Latest Type
KEARNEY & TRECKER #3K, Timken, Latest Type
KEARNEY & TRECKER Single & Double Spindle Profiler, Latest
MOREY 12M Single & Double Spindle Profiler, Latest
REED PRENTICE 3VG, with or without hydraulic duplicator, Timken bearing, Latest Type

PLANERS
BETTS (CONSOLIDATED) 84"x92"x16' 4 heads, Box
Table, Rapid Traverse, D.C. M.D. Late Type
BETTS (CONSOLIDATED) 108"x84"x24' 4 heads, Box
Table, Rapid Traverse, D.C. M.D. Late Type
CINCINNATI 36"x36"x10' 4 heads, PRT, DC, M.D.
DETRICK & HARVEY 48"x48"x16' 4 heads, Hydraulic, Rapid Traverse, A.C. Motor Drive
NILES 108"x84"x42" 4 heads, Box Table, Rapid Traverse, D.C. M.D. Late Type
NILES 42"x42"x16' "Time Saver" Box Table, 3 Heads, PRT, VARI-VOLTAGE Drive, Latest
NILES BEMENT POND 96"x96"x24', 4 heads

PRESSES
BIRDSBORO 225 ton, vert. hyd., Latest Type
BLISS 75-35 Hydro-Dynamic, Double Action, Latest
GLEASON 150 ton Blanking, Rolling Feeds, M.D.
HENRY & WRIGHT 50 ton Dieing, Rolling Feeds, M.D.
LAKE ERIE 500 ton Vert., Hyd., Latest Type
NILES 400 ton, Horiz. wheel, Motor Drive
UNITED ENG. 500 ton, Vert., Hyd., Latest

SCREW MACHINES—Automatic
ACME GRIDLEY 3" Model BAS, 6 spindle, Latest
CLEVELAND 9/16", 11/16" Model A, Latest Type
CONOMATIC 1¼", 6 spindle, High Speed, Latest Type
CONOMATIC 2½", 6 spindle, high speed, Latest Type
GOSS & DeLEEUW 6"x24", 5 spindle Chucker, Thread rolling, Latest Type
GOSS & DeLEEUW 6" 5 spindle Chucker, Work Rotating, Latest Type

SHAPERS & SLOTTERS
AMERICAN 20" Heavy Duty, Motor Drive
DILL 20"-24" Vertical, Motor Drive
GOULD & EBERHARDT 20", 22", High Duty, M.D.
GOULD & EBERHARDT 6" Vertical, M.D.
PRATT & WHITNEY 6" Vertical, M.D.
SMITH & MILLS 16" high speed, latest type

SHEARS—Power
WYSONG & MILES #572, 14 gauge x 6', Latest Type
QUICKWORK #5, 5" Cap., Rotary Shear, M.D.
QUICKWORK #6, 1" Cap., Rotary Shear, M.D.

MISCELLANEOUS
AJAX 2", 3¼" Forging and Upsetting, M.D.
BAKER #5 Kerrsetter Motor Drive
BARNES #172, 206H, 307, 307B Vertical Hone, Hyd.,
Self-Oiling, Latest Type
CAMPBELL #401 Abrasive Saw, Latest Type
DB LaVAL #194 Coolant Clarifier, Latest
LANDIS 2" Single & Double Spdle, Bolt Threader, M.D.
MANVILLE 2D 7/16" Cap. SSBD, Ball Header, M.D.
NAZEL #4B Pneumatic Hammer, M.D.
NORTON #2F 10K Vertical Dresser, Latest Type
PRATT & WHITNEY (KELLER), Type BL-2416
Type G Copying, 2 and 3 dimensional, Latest Type
ROWBOTTOM Cam Miller, Motor Drive
VERSON #296 10 gauge x 96" Press Brake, Latest
WATERBURY FARREL #20 Thread Roller, Motor Drive

WATCH THIS PAGE!

For MODERN high quality machine tools nearly all built new since 1941. These tools are priced well within your equipment budget. *Wire, write or phone for pictures, details and prices, today.*

NILES 60"x55' Centers "Time Saver" Heavy Duty Engine Lathe—2 carriages, Power Rapid Traverse with each carriage, Latest Type (NEW 1943)

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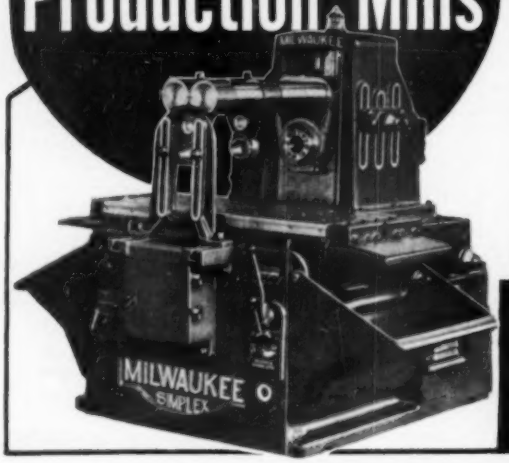

Designed to do multiple work in less time per unit . . . For Face Milling, Die Finishing, Routing, Profile Milling, End Milling, Vertical Boring, Slotting, Jig and Fixture Work . . . Milling of Multisurfaces at Varying Heights . . . You'll SAVE TIME . . . CUT COSTS with Production Mills.

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Cincinnati No. 1-2
Cincinnati No. 2-18 Pl.
Cincinnati No. 1-8 Rise and Fall
Cincinnati No. 0-8 Horiz. and Vert.
Cincinnati 12 x 36 Prod.
Cincinnati 48" and 18" Duplex
Cinn. Vert. Rail Type 20" x 66" table, 3 spindle head
K. & T. M-18 and No. 1224
Intersoll Vert. 42" x 36" x 8", 2 spindle
Kent-Owens No. 1-8
No. 1404 Kearney & Trecker Duplex
Newton 4 spindle Duplex Rotary
Ohio Type "P" 36" Table Feed
Sundstrand No. 0 and No. 00
No. 3 Sundstrand Rigidmill
Van Norman No. 1-18

DOUBLE SAVINGS CAN BE YOURS...

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BOREMATIC, Excello #215A Double End
BOREMATICS, Heald #49 Double End
BORING MACHINE, Excello #34, 2 Way
DRILL—RAIL, L. Gifford 2 Sp. Univ.
DRILL, Natco B4B 46-Spindle Vertical
GEAR MACHINE, Cross #38
GRINDER, Norton 6"x18" Semi-auto.
GRINDER, Cinc. 6"x30" Semi-auto.
GRINDER, Landis 6"x30" Type "C"
GRINDER, Norton 10"x18" Plunge Type
GRINDER, Cincinnati 12"x24" Univ.
GRINDER, Cincinnati 12"x36" Univ.
GRINDER, Hanchett #36—40" Chuck
GRINDER—THREAD, Excello #33
GRINDER, Milwaukee Face Mill
GRINDER—DISC, Besly #218 Opposed
HYPROLAP, Norton #28
LATHE—AUTOMATIC, Sundstrand #8
LATHE—AUTOMATIC, Gisholt #12
LATHES—TURRET, Gisholt #3 Bar Feed
LATHES—TURRET, W & S #4 Bar & Chk.
LATHE—TURRET, J & L #4 Bar & Chk.
LATHE—VERT. TURRET, Bullard 36"
MILLER, Cincinnati #3-24 Simplex
MILLERS, Cincinnati #4-36 Hydromatic
MILLERS, K&T #1224 & #1248 Prod.
MULTAUMATICS, Bullard 12" & 16" 8-Sp.
SCREW MACHINES, Cone 1¼" thru 2½"

BRM

MACHINERY CORPORATION
57 EDISON PLACE
NEWARK 2, NEW JERSEY

NEW—SURPLUS

VICTOR SWIVEL BASE MILLING MACHINE VISES

Width of Jaws	6"	Price $35.00 each
Depth of Jaws	1½"	
Opens	4"	
Weight	65 lbs.	
Width of Jaws	4"	Price $27.50 each
Depth of Jaws	1¼"	
Opens	3"	
Weight	40 lbs.	

With graduated swivel base, equipped with wrench. In stock for immediate delivery.

Victor Machinery Exchange, Inc.
251 Centre St., New York 13, N. Y.
CAnal 6-5575

HORIZONTAL BORING MILLS

#33 Lucas, 4½" bar, equipped with heavy OVERHEAD VERTICAL MILLING ATTACHMENT, 36" ROTARY TABLE; extra width, extra height; brand new leadscrews and nuts for the head; 10 hp motor; excellent.

3" bar UNIVERSAL "Tri-Way", standard machine, 1942.

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence, R. I.

Metal Forming and Bonding Machine
#206-F Toledo 135 Ton D.C. Press, 3" Stroke, 20" x 110" Bed Area
#6-D Potter & Johnson Turret Lathe
12 Spindle Moline Automatic Drilling Machine
3 Spindle Moline Model 7-D Cylinder Borer
1-A W&S Universal Turret Lathe
36"x14' Schumacher & Boye Engine Lathe
Libby 20"x4½" Spindle Turret Lathe
20" Stockbridge Shaper
Lees-Bradner CT 36" Thread Millers
Crankshaft Grinder
Foote-Burt 4 Spindle Drill #2 M.T.
24"—M.S. Milling Cutters (New)

CONTINENTAL SALVAGE & MACHINERY CORPORATION
1836 EUCLID AVENUE, CLEVELAND 15, OHIO
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NEW YEAR INVENTORY SPECIALS

#C Becker Vertical Milling Mach.	$ 450.00
2" Curtis Pipe Threading Mach.	200.00
HC Wardwell Band & Hack Saw Grinder (2) ea.	325.00
K5 Wardwell Band Saw Filer & Setter	150.00
#4 Warner & Swasey Turret Lathe	400.00
70A Heald Univ. Internal Grinder	750.00
42" Bullard Vertical Turret Lathe	3150.00
500 Amp. Hornet Arc Welder	275.00
160 Amp. AC Arc Welder	90.00
7½ KVA Spot Welder	80.00
#57 Stahl 70 Ton Punch Press, SS	400.00

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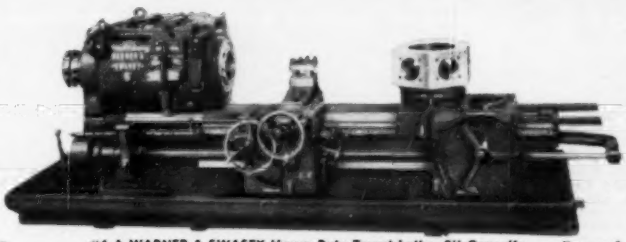
AUTOMATICS

Brown & Sharpe, Nos. 00G, 4 and 6.
Conomatic 8 sp. 1¾" cap., CECO ⅜".
Fay Automatic, 12" x 81".
New Britain No. 61—2¼" 6 spindle.

BORING MILLS

Giddings & Lewis No. 0, No. 25T.
Lucas No. 31, horiz.
Heald 48A, 49.
Universal 3" horiz. equipped.



#4 A WARNER & SWASEY Heavy Duty Turret Lathe, 8" Capacity.

DRILLS AND RADIALS

Allen, Foote-Burt 6 Sp.
Cincl-Bickford Sup. Ser. 21".
Carlton 8' 19" col., Canedy-Otto 3' 9" col.
Sibley 24"-28", Hamilton, Langelier, Hi Speed.

ENGRAVERS

Gorton Nos. 3L, 2U, 3Z, Deckel G1.
Gorton Cutter Grinders 375-2, 265-6.

GEAR EQUIPMENT

Fellows 72, 725, 645Y, High Speed.
Gleason #2 Surface Hardener.
Michigan, Gleason, Fellows Checkers.
Mikron Gear Hobber.

GRINDERS, MISCELLANEOUS

Brown & Sharpe No. 5 cyl. 3" x 18".
B. & S. Nos. 1, 2, 3 Univ., No. 13 Univ. Tool.
Cinc. No. 2 Centerless Filmatic.
Cinn. 12 x 36", 12 x 48" Filmatic Univ.
Covel No. 91A Univ. Tool & Cutter.
Gardner #226, 30" Disc.
Heald 72A3 Siematic Int. Centerless.
Landis Centerless.
K.O. Lee Tool & Cutter.
Landis No. 4H Cyl. 4x 12", No. 6 Thread.
Norton No. 2 Tool & Cutter, Hyd.
Oliver 510 Drill Grinder, Sellers 4G Drill Grinder.

GRINDERS, SURFACE

Abrasive No. 33, 34 Vert., 8 x 24 Chuck.
Blanchard No. 11 16" Mag. Chuck.
Brown & Sharpe No. 5, 8x24" Hydr.
G. & L. No. 25, 35 Hyd., 6 x 18", 8 x 24".
Hanchett Model 200, 12 x 42".
Mattison, 14 x 16 x 48. Hyd.
Norton 6 x 18". Hyd.
Reid No. 2A, P.F. MIB., No. 2C Pope Spdl.
Thompson Hyd. 6 x 10 x 18", 6 x 12 x 18".

LATHES

Bradford 14" x 6', Sebastian 12" x 4' G.H.
Hardinge Precision, 1" Collet Cap., Rivett.
Hendey G. H. 16 x 30", Rel. Att.

Hydraulic Presses

DOWN MOVING RAM, SELF CONTAINED

MANUFACTURER	TON CAP.	STR. OPENING		PLATEN
Lake Erie	500	36"	68½	35 x 36
Baldwin Southwark	600	32"	36"	76 x 59
H.P.M. Double Action	500	24"	30"	36 x 36
Watson Stillman Shaft Straightener	500	24"	57"	24' bed.
Denison	25/50	18"	23"	22 x 20
Hanna	50	20"	30"	22 x 30
Southwark, D. A. Clamping Plate	150	30"	2' to 4'	84 x 30
Oilgear Shaft Straightener	35	8"	12"	84 x 11

DOWN MOVING RAM, WITHOUT POWER UNIT

Mesta	750	42"	80"	44 x 44
Chambersburg	300	10"	27"	22 x 36
Southwark	350	42"	78"	28 x 48

UP MOVING RAM PRESSES

Waterbury Farrel	1000	7"	55½"	30 x 28
Waterbury Farrel	800	6½"	28"	22 x 24
Waterbury Farrel (3 Rod)	500	6"	28¾"	28" Bet. Rods
Watson Stillman	300	12"	21"	24 x 20
Watson Stillman	300	12"	19"	20 x 20
Watson Stillman (Hob) New and Used	300	6"	22"	16 x 16
HPM	180	15"	14½"	30 x 30
Dunning & Boschert Molding Press	300	12"	38"	24 x 32 Mold
Stokes Molding Press and Pump	100	7"	24"	22 x 15
Stokes Molding Press and Pump	150	8"	31"	24 x 23
Elmes—With Elec. Plates	50	6"	12"	18 x 18
Stewart Boling	85	10"	19"	20 x 20

WHEEL PRESSES

NILES—400 ton 96"; 500 ton—48"; 300 ton—48".

INJECTION MOLDERS

ACCUMULATORS

Mfr.	Size	Pounds
HPM	6" x 9'	2000
General Electric	15" x 11'	400
Watson Stillman (13 gal) Hydr. Pres.	42 x 9 x 48"	3000

LeBlond Regal 15 x 30", 21 x 60", 10" x 3½', 19 x 48", LeBlond Heavy Duty 16 x 33",
Lodge & Shipley 16 x 78" T.A., Collets, etc.
Monarch 10"x 20" EE, 16 x 78 G.H., 13 x 30"
South Bend Q.C.G., 13" x 6', 10" x 4', 14" x 6'

MILLS, PRODUCTION

Brown & Sharpe, No. 000, 12, 21.
Cincinnati No. 1-12, 1-18, 2-18 Mfg.
U. S. Multimiller, 1 and 2 Spindles.
Sundstrand 60 Rigidmills, Nichols, Kent Owens IV.

MILLS, PLAIN AND UNIVERSAL

B. & S. No. 2B Plain, 2A Univ.
Cincinnati No. 3 Plain, 2MH Univ.
Kempsmith 2G Power Rap. Trav.
Milwaukee 2HL, 2H Univ., 2H Plain.
Van Norman Duplex, 12, 20, 22L, 36.

MILLS, VERTICAL

Bridgeport, Index, Jackson.
Brown & Sharpe No. 2 Standard.
Cincinnati No. 4, Hi-Power.
Gorton No. 8D, 9J Plain, 8½D Duplicator.
Kearney & Trecker, 3H.
Moore Jig Grinder.
Morey No. 12M Profiler 2 sp.
Sipp MP5 Jig Borer.

PRESSES

Bliss No. 406 Toggle, Double Crank. Bed 42 x 48", D.A.
Bliss No. 645B, 650, 675 Hi-Production, 58, 62, 62A, 162, 304A, 305A.
Bliss No. 8, 42 x 100", 4½ Double Action Cam Press
Henry & Wright 75 Ton Dieing, 25 Ton.
L & J #2, 3, 4, O.B.I.
Reliance 45 Ton, O.B.I.
Gen. Screw Press.
Z. & H. 30 Ton, O.B.I.
Stokes Tablet Presses, Model R & T.

TURRET LATHES

Acme No. 4W, 6W Bar and Chuck, Acme Fox.
Bardons & Oliver No. 3, 1½" cap., No. 5, Chuck.
Brown & Sharpe No. 1, 2F, Foster No. 3B.
Gisholt No. 4, 5 Bar and Chuck, H.
J. & L. No. 8A, Well Tooled, Excellent, Saddle type.
Warner & Swasey No. 2, 4, 5, Preselector, No. 4A 8" Cap.

MISCELLANEOUS

Band Saw: Doall Contour, Tannewitz No. 36M.
Bending Roll: Buffalo No. 0, Excelsior 14, Buffalo Wrapping Roll No. ⅛.
Comparator: Jones & Lamson BC5.
Hacksaw: Marvel Nos. 4B, 6 and 6A Auto.
Notching Press: Ferracute C62.
Pin Machine: Nilson.
Shaper: Gould & Eberhardt, 22" Univ., Vernon 12" Brand New
Shaper—P&W 6" Vertical.
Honer: Micromatic Hydrohoner, Sunnen.
Keyseaters: Mitts & Merrill, Baker, Burr.
Rivet Hammers: Hi Speed, Chic. Pneumatic.
Toolmakers Microscope: Gaertner, B & L.
Router: Onsrud W240, #55 Oliver.
Tapper: Bakewell #1, Haskins 3C, 2C.
Thread Roller: Waterbury Farrel #30
Welders—Spot & Seam: Thompson, Taylor, Winfield.

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MONA MEMBER

LATEST TYPES — GUARANTEED MACHINE TOOLS 1941-1946 MODELS

MILLING MACHINES
MILWAUKEE—2H Universal, H.S.
MILWAUKEE—2K Vertical, Sliding Head, H.S.
CINCINNATI—2M Vertical, Rotary Table
CINCINNATI—No Vertical
CINCINNATI—4-36, 4-42, 45-48, 56-96 Plain Hydromatics
CINCINNATI—48-96 Hydromatic Rail Type, 2 Vert. Spdls. Tracer control
SUNDSTRAND—3S—Rigidmill, 3 Vert. Heads
SUNDSTRAND—9S—Rigidmill, Duplex—(arr. for milling the cam tracks in propeller hubs or similar works)
SUNDSTRAND—9S—Rigidmill, Hydraulic
BROWN & SHARPE—No. 10 Plain, Production
BRIDGEPORT—Vertical, Turret, Hand Feed
MOREY—No. 12M 2-spindle Profiler
TAYLOR & FENN—M-80 Duplex Spline
RICE BARTON—Model K Duplex Spline
DECKEL Type—Die Sinker & Engraver (new)

THREAD MILLERS & TAPPERS
HANSON WHITNEY—8"x10" Thread Miller
MOREY—12"x60" Thread Miller
LEES-BRADNER—#40A Thread Miller
HALL-PLANETARY—Type "B" & "C" Thread Millers
KAUFMAN—5A—Tapper, Lead Screw Type
MURCHEY—#22—Tapper, Horizontal

GRINDERS—THREAD
EXCELLO—No. 31 & No. 33 External
JONES & LAMSON—TG-636 External
JONES & LAMSON—TG-1245 External
JONES & LAMSON—TG-125 Internal

GRINDERS—CYLINDRICAL
LANDIS—4"x12" Type "H" Hydraulic, Plain
LANDIS—6"x18" Type "C" Hydraulic, Plain
LANDIS—12"x18" Type "C" Hydraulic, Plain
LANDIS—18"x32" "Type D" Crankpin, Hydraulic
CINCINNATI—6"x18" Hydraulic, Filmatic
CINCINNATI—10"x72" Hydraulic, Filmatic
NORTON—12"x30" Model "D" Universal
BROWN & SHARPE—No. 5 & No. 10 Plain

GRINDERS—INTERNAL
HEALD—72A5 Plain, Fixed or Cross Feed Hd.
HEALD—72A3 Plain, Cross Feed Head
HEALD—72A3 Universal, T-Bed
HEALD—72A5 Sizematic
HEALD—72A3 Sizomatic Centerless
HEALD—172 Gap Bed, Sizematic
BRYANT—112 Universal, Hydraulic
BRYANT—16-28 Hole Grinder
BRYANT—24-36 Heavy Duty
RIVETT—No. 104 Tool Room Grinder

GRINDERS—RADIUS
VAN NORMAN—No. 73 Oscillating Internal
VAN NORMAN—No. 649 Oscillating, Internal
VAN NORMAN—No. 639 Oscillating, External
VAN NORMAN—No. 3½ Radius, Universal

GRINDERS—SURFACE
THOMPSON—6"x12"x18" Type "B" Hydr.
THOMPSON—6"x12"x24" Type "B" Hydr.
THOMPSON—12"x10"x24" Type "BB" Hydr.
THOMPSON—12"x12"x48" Type "B" Hydr.
THOMPSON—12"x16"x48" Type "C" Hydr.
THOMPSON—12"x18"x96" Type "C" Hydr.
THOMPSON—24"x16"x60" Type "B" Hydr.
THOMPSON—24"x30"x120" Type "C" Hydr.
HEALD—No. 22 Rotary, 12" Magn. Chuck
ARTER—Model A-1, 8" Rotary
GARDNER—Model 1208 Opposed Hd. Disc Grinder

HONING MACHINES
MICROMATIC—Model H-510 Hydrohoner, D.E.
MICROMATIC—Model H-2 Hydrohoner, S.E.

LAPPING MACHINES
NORTON—No. 20 Hyprolap
NORTON—Model 2F x 36" Hand Lapping
CINCINNATI—No. 2 Centerless
ULTRA-LAP—No. 10 Lapping

GEAR & SPLINE GRINDERS
PRATT & WHITNEY—10" Single Wheel
PRATT & WHITNEY—10" Double Wheel
PRATT & WHITNEY—16" Single Wheel
GEAR GRIND. MACH. CO.—GG-33 (10"x42") & GG-19 (10"x24"). Hydr. for Spur Gears and Splines
GLEASON—No. 17 for Spiral, Zerol and Hypoid Bevel Gears

GEAR CUTTING MACHINES
FELLOWS—No. 61 Gear Shaper
FELLOWS—No. 72 Gear Shaper
FELLOWS—No. 7 Gear Shaper
FELLOWS—Straight Line Generator
FELLOWS—Model Z Horiz. Shaper
GLEASON—3" Bevel Gear Generator

GEAR FINISHERS & TESTERS
FELLOWS—8L51 & 13L51 Gear Lappers, External & Internal, Spur & Helical
FELLOWS—No. 12 Shaver, Crowning Attm't.
GLEASON—Nos. 4 & 6 Bevel Gear Testers, hand & power operated
GLEASON—No. 13 Bevel Gear Tester, Univ'l.
ILLINOIS—No. 224 Involute Checker with or without recorder
MICHIGAN—No. 1124 Involute Checker with recorder
NATIONAL BROACH—Model SIC-12" Gear Tester

PRECISION BORING
HEALD—48A Borematic, S.E., 2-Sp. & 1-Sp.
HEALD—47A Borematic, S.E., 2-Spindle
HEALD—49 Borematic, D.E., 4-Spindle

LATHES — PRODUCTION
POTTER & JOHNSTON—5D Automatic
LODGE & SHIPLEY—3A Ducomatic
LIPE-ROLLWAY—15"x30" Carbomatic
MICHIGAN TOOL—No. 1708 Univ'l Relieving
LEBLOND—25"x48" Engine Lathe, raised to 40"

TURRET LATHES
GISHOLT—No. 3 Ram Type, Bar
GISHOLT—No. 5 Ram Type, Bar
JONES & LAMSON—No. 5 Ram Type, Bar
JONES & LAMSON—No. 7A Saddle Type, Chuck
WARNER & SWASEY—No. 3A Saddle Type, Bar
FOSTER—No. 2F Fastermatic
FOSTER—No. 4F Fastermatic

AUTOMATIC SCREW MACHINES
ACME-GRIDLEY—Mod. RA-6, 9/16" & 1", 6-Sp.
CONE—Conematic, 1¼", 6-spindle

DRILLING MACHINES
LELAND-GIFFORD—Mod. 2-LMS Deep Hole Vert'l.
BARNES-DRILL—No. 2011A, 2-spindle, wide base
BAKER—No. 21Z, Upright, H.D.
BAKER—No. 30-HO 2-spindle, Inverted
FOSDICK—Model 48M, Upright, H.S.
PROVIDENCE ENG.—3/16" Sensitive, 6-spindle
P. & W.—6½ Bal. Disc Hole Sharpener
SUNDSTRAND—No. 53, 4"x30" Centering

MISCELLANEOUS
CAMPBELL—No. 425 Cutalator
WILLIAMS—10" Pipe Cut Off Machine
RANSOME—No. 30 Welding Positioner
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OLIVER—10" Template Tool Bit Grinder
TANNEWITZ—Model GH-36 Band Saw
KENT—5¼" Bar Pointer
OSBORN—No. 184 Core Blower
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DEMISON—918AM Test Stand

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CINN.-BICKFORD 5'15" Col. Super Ser. Rad.
LELAND-GIFFORD #1LMS 6-spindle-coolant
LELAND-GIFFORD #1LMS Single Spindle, Hyd. & Mech. Feeds (2)

GEAR MACHINERY:
BARBER-COLMAN Type A Gr. Hb.Cp.12"x36" Cap. 12"x36"
GLEASON 12" Straight Bevel Gear Generator
HANSON-WHITNEY 8"x16" Thread Miller
LEES-BRADNER #40 Thread Miller
PRATT & WHITNEY 4½"x20 Mod C Th Mil.

GRINDERS:
CINN. #2 Filmatic Centerless (2)
HEALD #72A3 Hyd. Internal
HEALD #81 Centerless Internal
LANDIS 10"x48" Hyd. Type C Plain
NORTON 6"x18" Hyd. Type C Plain
NORTON 12"x36" Hyd. Type C Multi-Pur. Uni.
NORTON 6"x18" Hydraulic Surface
REID #2B 6"x18" Auto. Feed Surface

TURRET LATHES:
GISHOLT #1R—5/16" hole, Saddle, Bar & Ck.
JONES & LAMSON #3—1½" Ram—Uni. Ck.
WARNER & SWASEY #3-1½ Ram—Uni. Bar

LATHES:
BRIDGEFORD 36"x84" cc 9-speed Gd. Hd.
LEBLOND 14"x54" cc 12-speed Geared Head
LODGE & SHIPLEY 24"x6' cc Patent Geared Head (older style)
MONARCH 10"x20" cc Md. EE Prec. Toolmakers

MILLING MACHINES:
CINC. #2 Hi Speed Dial, Vert., P.F. to Hd.
CINC. #1-12 and #1-18 Production
CINC. #2-18 Production
INDEX Tool Room
MILW. (K&T) #4H Plain Hor.
MILW. (K&T) #5H Plain Hor.
MILW (K&T) #2B Plain Hor.
MILW. (K&T) #2K Vert. P.F. to Head
MILW. (K&T) #4H Vert. P.F. to Head
NICHOLS Hand Miller (2)
VAN NORMAN #12

MISCELLANEOUS:
BUFFALO #½ Univ. Ironworker (NEW)
BULLARD 36" Sp. Dr. Hi Sp. Vt. Bor. Mill
FOOTE-BURT 1½" cap., Sq. Sp. Automatic
HEALD #9 Single & Double End Borematics
MARTIN #12 Hyd. Marking Machine

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#61 New Britain-Gridleys—2¼" cap.—bar
#65 New Britain-Gridleys—5¼" cap.—chucker
#12 Brown & Sharpe Prod. Miller
3' Morris "Mor-Speed" radial, motor-on-arm
Nichols Hand Miller—pump, etc.
Doall 6x16 Hydraulic Surf. Grinder
BG-8 Porter Cable belt surfacer, m.d.
WG-4 Porter cable belt surfacers (4) m.d.
Perkins #2 Power Press, m.d.
#3 Warner & Swasey Turret—bar ser. 525,000
#3 Warner & Swasey Turret—chucker ser. 614000
Grenby Internal Grinder—m.d.

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#28/60 Vertical Cincinnati Hydrotel, '44
2300 ton Bliss Hydraulic Press, sacrifice, late!
#2, #3 Cinci. Dial type, Univ. Mills
6'17" Column Amcrican Hole Wizard Radial Drill, AC Motor on Arm
5" Fisher Horiz. Floor Type Boring Mill, Late
5" Bar Table type boring mill, Giddings & Lewis #350T
#12 Brown & Sharpe Production Mills, 48½" x12" table size, $2250.00 ea.
#18 Blanchard Surf. Grinders 36" chuck, late type.
9/16", 1", 1¼", 1⅝", 2¼", 2⅝" RA6 Acme Gridley Auto.

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Shaper, Draw Cut, 36" Morton.
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West Penn Machinery Company

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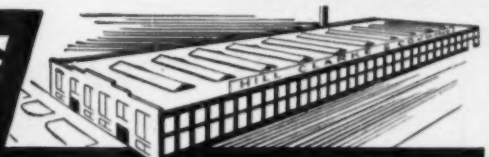

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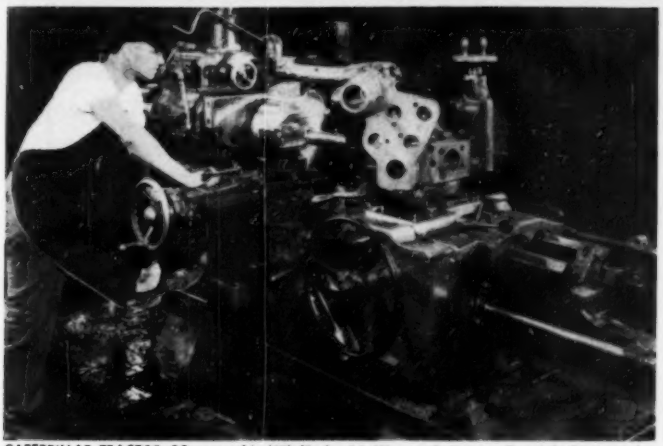

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3. Modern machines—no worn out equipment.
4. You can see your machine tested under power before purchasing.
5. Hill-Clarke's unconditional money-back guarantee.

AUTOMATICS

No. 2 Brown and Sharpe
1⅝" Greenlee, 6 Spdls. (1941)
No. 61 New Britain 6 Spdls. 1⅝" (1942)
No. 6 Brown & Sharpe, M.D.
No. 49 New Britain, 4 Spdl. chucker (1942)
Model A 2½" Cleveland (1943)
Model A 3¾" Cleveland (1942)

DRILLS

No. 200—26' Defiance, No. 5 Taper (1943)
No. 150 Baker Mfg. Type, M.D.
No. 150 Baker, Tapper (1942)
No. D8 Colburn, No. 6 Morse Taper
No. 1LMS—12"—4 Spdl. Leland-Gifford
No. 1LMS—20"—5 Spdl. Leland-Gifford
No. 2LMS—26"—1 Spdl. Leland-Gifford
No. 2LMS—14"—2 Spdl. Leland-Gifford
No. 2LMS—14"—3 Spdl. Leland-Gifford
No. 2LMS—26"—4 Spdl. Leland-Gifford
No. 2LMS—26"—6 Spdl. Leland-Gifford
No. 4BL NATCO Holesteel—36 Spdls. (1944)
3' American Triple Purpose Radial
5' Western Radial (1942)
6'-17" Col. Fosdick Economax Radial

GEAR MACHINES

No. 61-A Fellows Gear Shaper (1942)
No. 7125 Fellows (1943)
No. 712 Fellows Auto Indexing (1943)
No. 72 Fellows Gear Shaper (1942)
No. 16 HS Gould & Eberhardt
No. 18H Gould & Eberhardt
No. 6 Gleason Gear Tester
12" Gleason Bevel Gear Cutter

GRINDERS

3" x 12" Brown & Sharpe No. 5 (1944)
4" x 12" Landis, Model H (1942)
6" x 18" Norton Type C Plain (1943)
6" x 30" Norton Type C Plain (1943)
10" x 18" Norton Type C Plain (1943)
10"-14" x 36" Norton Type C Plain (1942)
10"x48" Norton Type C Plain (1943)
10"x96" Landis Type C Hydraulic (1942)
Norton Motorized Grinders from 6" x 18" to 24" x 240"
12" x 48" Cincinnati Univ. (1946)
No. 36-A Hanchett Rotary Surface (1942)
72A-3 Heald Internal Grinder (1942)
72A-5 Heald Internal Grinder (1942)
74 Heald Internal Gdr. (1942)
No. 5 Bryant Internal Grinder (1942)

HORIZONTAL BORING MILLS

No. 350-T Giddings & Lewis Table Type.
No. 31 Lucas, 3" bar
No. 46-B Heald Bore-Matic (1942)
No. 112-C Excello 2 Spdl. (1942)

LATHES

14" x 30" centers Pratt & Whitney, Model C.
14" x 30" centers Monarch
16"x54" centers LeBlond (1941)
16" x 60" centers Pratt & Whitney, Model B.
18" x 6' American, Grd. Head
20" x 8' American, Grd. Head, M.D.
36"-48" x 16' Lehmann Hydrotrol (1945)
36" x 24' Lodge & Shipley, Grd. Head, M.D.
50" x 17' Centers Leblond (1942)

LATHES (Production)

8" x 15" Sundstrand, Model D (1943)
10" x 16" Sundstrand Model D (1942)
10" x 22" Sundstrand, Model AA (1943)
16" x 33" Fay Automatic (1942)
29" x 25" Fay Automatic (1942)

MILLING MACHINES

No. 2H Milwaukee Plain (1942)
No. 2 Cincinnati Vert. (1942)
No. 2M Cincinnati Vert. (1941)
No. 3 Cincinnati H. P. Vertical
No. 1 U. S. Hand Miller
No. 00 Sundstrand Rigidmill (1943)
No. 1-18 Cinn. Mfg. (1940)
No. 2—18" Sundstrand-Electromil (1942)
No. 2—18" Cinn. Rise & Fall (1940)
No. 4-48 Cincinnati Hyd. Tracer (1942)
No. 34-48 Cincinnati Hyd. Duplex (1943)
No. 45-48 Cinn. Hyd. Plain Tracer (1942)
No. 56-72 Cincinnati Hydromatic (1941)
No. 28-60 Cincinnati Hydro-tel
4" x 9" Hanson-Whitney Univ. Thrd. Miller
4½" x 12" Pratt & Whitney, Model C
6" x 36" Lees-Bradner—Model HT (1943)
6" x 48" Pratt & Whitney Thrd. Miller
6" x 80" Pratt & Whitney Thread
6" x 168" Pratt & Whitney Thread
12"x 24" HT Lees-Bradner (1942)
10" x 48" Hanson-Whitney Thread
No. 10—72" x 6' Ingersoll Trav. Col. Face Miller (1942)

MISCELLANEOUS

18" Dill Slotter
Model H-7 Micromatic Hydro Honer (1943)
Model H-2 Micromatic Hydro Honer (1944)
Model 200 Micromatic Hydro Honer (1943)
Model H-100 Micromatic Hydro Honer (1943)
Model 200—H5 Micromatic Horiz. Hone (1942)
Model HRS Barber-Colman Sharpener

PLANERS

36" x 36" x 12' Cincinnati
36" x 36" x 18' Gray, 4 Heads
48" x 36" x 14' Gray
48" x 48" x 12' Cincinnati, 4 Heads

TURRET LATHES

No. 2 Warner & Swasey, Bar Feed (1942)
No. 4 Gisholt Universal Turret Lathe (1942)
No. 4R Libby, Bar Feed (1942)
No. H-5 Libby (1942)
No. 5 Bardons & Olivers (1942)
No. 5 Midland, Bar Feed (1942)
No. 1-H Libby, 6¼ Hole in Spindle
No. 1-H Libby, Extra Long Bed (1942)
18" Libby, 3½" Hole in Spindle

VERTICAL BORING MILLS

36" Bullard Hi-speed (1942)
42" Bullard (1944)
42" Colburn
60" Colburn
72" Niles Extra Heavy
84" Betts

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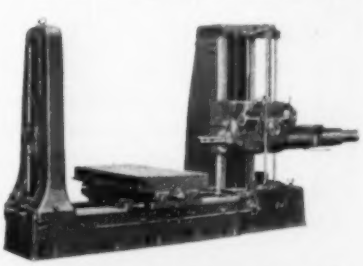
A saving of over $12,000. This No. 350-T Giddings and Lewis Hi-power precision horizontal boring, drilling and milling machine. A very fine tool with extra capacity and additional features. See it under power at our plant now.



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#40—4" Landis Floor Type
6" Simmons

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#49 Heald Universal Single End
Three—#49 Heald Double End
#113C Excello Senior Single End
Two—#DB10I Excello Double End
Two—#DB21G Excello Double End

RADIAL DRILLS

4' Cincinnati Bickford, 84" Rotary Table, 1942
5' Dreses
5' American Triple Purpose

GRINDERS

#16—16" Bryant Hydraulic Internal
#70A Heald Internal
6"x18" Cincinnati Model EA Plain Hydraulic
8"x18" Norton Type C Plain Hydraulic
10"x18" Norton Type C Plain Hydraulic
14"x48" Cincinnati Plain—1942
8"—#20 Heald Rotary Surface
12" Model A3 Arter Rotary Surface
#7 Grand Rapids Universal and Tool
#2 Cincinnati Centerless—1942
6"x15" Model TG615 J and L Auto. Thread.
#95—86" Bridgeport Face—1942
#86—100" Bridgeport Face—1944

NUT AND BOLT EQUIPMENT

#250C Manville 588D Header
#250C Manville 588D Ball Header
#2B Manville Horiz. Thread Roller
#2C Manville Horiz. Thread Roller
#20 Waterbury Farrel Inclined Thread Roller

LATHES

14"x36" Pratt & Whitney Geared Head
18"x12' Hendey Geared Head
27"x48" LeBlond Heavy Duty Geared Head—1941
42"x108" Niles Heavy Duty Geared Head—1943

PLAIN MILLERS

Seven—#2SP Van Norman Plain—new since 1940
Five—#3SP Van Norman Plain—new since 1940
#26 Van Norman Plain—1943
#2 Cincinnati Medium Speed Dial Type—1940
#3 Cincinnati High Speed Dial Type—1942
#3 Cincinnati Medium Speed Dial Type
#4H Kearney & Trecker
#5HM Kearney & Trecker

UNIVERSAL MILLERS

#3 Kempsmith
#3SU Van Norman—1943

VERTICAL MILLERS

#06 Cincinnati—1940
Three—#3 Cincinnati Medium Speed Dial Type—1942
#2 Standard Brown & Sharpe, 1942
#3V Van Norman
#3 Cincinnati Medium Speed Dial Type—1942
#3 Cincinnati High Speed Dial Type—1942
#4 Reed Prentice Vertical Miller & Die Sinker

PRODUCTION MILLERS

#000 Brown & Sharpe
#4—36" Cincinnati Plain Hydromatic—1942
#5—48" Cincinnati Plain Hydromatic—1943
#33B Sundstrand Duplex Rigidmil—1941

SCREW MACHINES

#60 New Britain Gridley Six Spindle
1⅛" Model R-6 Acme-Gridley Six Spdle
4⅝" Cone Four Spindle—1940

TURRET LATHES

#1 Warner & Swasey Electric Head—1940
Four—#4 Warner & Swasey Universal Geared Head—1942
#5U Foster Universal Geared Head
#1A Warner & Swasey Universal Geared Head—1941
#1L Gisholt Universal Geared Head—1942
#5 Gisholt Universal Geared Head

MISCELLANEOUS

#208 Chicago Steel Bending Brake
#12 Bertsch Seven Roll Plate Straightening Roll—1942

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SIZE	Analysis	Qu. (lbs.)	SIZE	Analysis	Qu. (lbs.)
5/16" Rd.	B 1113	6,125	1 1/32" Rd.	C 1022	14,447
29/64" Rd.	NE 8640	8,560	1 1/16" Rd.	B 1113	5,328
33/64"Rd.	B 1112	18,445	1 11/64" Rd.	8630	7,792
33/64"Rd.	NE 8620	14,528	1 3/64" Rd.	B 1113	13,000
9/16" Rd.	B 1112	4,050	1 1/4" Rd.	B 1112	8,000
13/16" Rd.	C 1019	8,238	1 1/4" Rd.	B 1113	53,816
53/64" Rd.	C 1016	14,882	1 1/4" Hex	C 1115	20,204
27/32" Rd.	B 1113	9,606	1 1/4" Hex	B 1113	8,340
15/16" Rd.	C 1016	35,893	1 9/16" Rd.	C 1137	20,227
15/16" Rd.	B 1112	6,046	1 13/16" Rd.	B 1113	15,814
31/32" Rd.	B 1113	12,830	2 1/4" Rd.	B 1113	25,276
61/64" Rd.	A 1335	55,359	2 1/2" Rd.	B 1112	9,584
.888/.888" Rd.	C 1016	19,933	1 3/8" Hex	B 1113	4,410
1" Rd.	A 8620	12,974	1 1/2" Hex	C 1016	10,054
1.007/1.010" Rd.	C 1016 P. P.	43,361	1 1/2" Hex	B 1113	10,034

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Boye & Emmes 24" x 16' Model E. 1942 Engine Lathe, Actual Swing 27½" 10' Center Distance, Geared Head, 12 spindle speeds. Excellent Condition.

Conomatic 8 spindle, 1½" Capacity automatic screw machine
2 Bakewell #1 Tapping machines
Warner & Swasey #2 Turret Lathe, 1" Cap. many extras
Warner & Swasey #4 Turret Lathe, Preselector on Head
Milwaukee "Simplex" #1218 Production Milling Machine
Cincinnati #45/48 Plain Prod. Milling Machine
Brown & Sharpe #2 "Light Type" Plain Milling Machine
Milwaukee #2H—24 Mfg. Type Milling Machine
Brown & Sharpe #000 Plain Prod. Milling Machine
Taylor & Fenn #4 Duplex Miller
Stevens Vertical Slotting Machine, Cap. 0 to 7", 12" Rotary Table
Baker #0 Keyseater, 1" Cap., Motor Driven, many extras
Hardinge Lathe on Metal Stand, Draw-in Att., Colleta, Motor Driven, Etc.

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B & S No. 2B Mill, double overarm.
Kempsmith No. 2 Maximill.
P & W No. 12B Profiler.
P & W 4½"x12" Type C Thread Miller.

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2—25 TON HENRY & WRIGHT Double Roll Feed, Scrap Cutter, M.D.—A-1 Cond.

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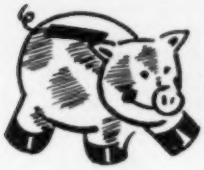

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LATEST TYPE MACHINES — BUILT 1941 OR LATER

BORING MILLS

3½" Cincinnati-Gilbert Horizontal Floor Type, m.d.

No. 25T Giddings & Lewis Horizontal, m.d., 2½" bar, latest

72" King Vertical, m.d., 2 swivel heads, 1 side head, latest

100" Niles Extra Heavy Vertical, m.d., p.r.t., late

RADIAL DRILLS

5'-11" Carlton, m.d. on arm, latest

6'-15" American Hole Wizard, m.d. on arm

GEAR MACHINERY

No. 61A Fellows Gear Shaper, m.d., latest type

No. 72 Fellows Gear Shaper, m.d., latest

Type D Barber-Colman Gear Hobber, m.d., latest

CENTERLESS GRINDERS

No. 2 Cincinnati, m.d., Filmatic Spindle, latest

No. 3 Cincinnati, m.d., Filmatic Spindle, latest

PLAIN CYLINDRICAL GRINDERS

No. 5—3x18" Brown & Sharpe, m.d., latest

6x18" Norton Type C Hydraulic, m.d., latest

10x36" Cincinnati Hydraulic, m.d.

UNIVERSAL CYLINDRICAL GRINDERS

12x48" Cincinnati Hydraulic, m.d., latest type

12x48" Norton, m.d., latest

18x48" Cincinnati Hydraulic, m.d., latest

SURFACE GRINDERS

No. 2 Brown & Sharpe, m.d. in base, late type

Hanchett Horizontal Spindle Plane Type, model OS, m.d., latest

No. 25A—24" Heald Rotary, m.d., latest

10x12x60" Norton Hydraulic Surface, m.d., latest

MANUFACTURING LATHES

No. 3 Lodge & Shipley Duomatic, latest

ENGINE LATHES

10x20" centers Monarch EE Geared Head, m.d., latest

14x30" Lodge & Shipley Selec. Head, m.d., latest

14"x54" centers Lodge & Shipley, m.d., latest

14"x102" centers LeBlond, m.d. in leg, latest

16"x30" Reed Prentice, m.d., latest

32"x12' Lehmann Hydratrol Geared Head, m.d., taper, latest

36"x36'6" Niles Heavy Duty, m.d., latest, 2 carriages

MILLING MACHINES

No. 2-18 Cincinnati Manufacturing m.d., with rise and fall, latest

No. 2-24 Cincinnati Manufacturing, m.d., latest

No. 4-48 Cincinnati Plain Hydromatic, m.d., latest

No. 4-48 Cincinnati Duplex Hydromatic, m.d., latest

No. 34-36 Cincinnati Duplex Hydromatic, m.d., with tracer control, latest

No. 34-36 Cincinnati Plain Hydromatic, m.d., with tracer control, latest

No. 56-72 Cincinnati Duplex Hydromatic, m.d., latest

No. 56-90 Cincinnati Duplex Hydromatic, m.d., latest

72"x6' Ingersoll Single Horizontal Spindle Traveling Housing Milling Machine, m.d.

No. 2B Brown & Sharpe Plain, m.d., latest

No. 2 Cincinnati Plain High Speed Dial Type, m.d., latest

No. 2HL Milwaukee Plain, m.d., latest

No. 2 Cincinnati Medium Speed Dial Type Universal, m.d., latest

No. 0B Cincinnati Vertical, m.d., latest

No. 2, 3, 4 Cincinnati High Speed Dial Vertical, m.d., latest

No. 2, 3 Cincinnati Medium Speed Dial Vertical, m.d., latest

No. 2H, 4H Milwaukee Vertical, m.d., latest

No. 2HL Milwaukee Swiveling Head Vertical, m.d., latest

No. 2K, 3K, 4K Milwaukee Dial Vertical, m.d., latest

No. 2B—120 Cincinnati Vertical Hydrotel, 1943 machine

TURRET LATHES AND SCREW MACHINES

No. 1H6 Libby, m.d., chucking, latest

No. 1A Warner & Swasey Universal, chucking, preselector head, latest

No. 2F Gisholt Fastermatic, m.d., latest type

No. 2L Gisholt, m.d., bar and chucking, latest

No. 3 Warner & Swasey Universal, m.d., bar, latest

No. 3A Warner & Swasey Universal, m.d., chucking, latest

No. 4 Warner & Swasey Universal, m.d., bar, preselector head, latest

No. 4A Warner & Swasey Universal, m.d., chucking, latest type

No. 4FU Foster Fastermatic, m.d., latest

No. 5 Warner & Swasey, m.d., bar, preselector head, latest

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If any machine guaranteed by us does not prove satisfactory mechanically, the purchaser may return it freight prepaid within 30 days and we will refund the purchase price in full.

• Fifteen years ago the T. R. Wigglesworth Machinery Company opened its doors in Cleveland and adopted the above guarantee for the protection of its customers. Our name plate attached to each machine that leaves our warehouse means that we have a lasting obligation to you. We are resolved that every customer shall be a "satisfied customer." To this end we have expanded our Sales and Engineering staff until it has reached a total of over 50 years in the Machine Tool Field. Our rebuilding is performed on precision equipment manned by experienced personnel. A purchase carries with it the following advantages.

1. Machines demonstrated under power
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3. Our guarantee is extended to you even after inspection
4. Immediate delivery
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AUTOMATICS
¾" Cleveland "A"
1-1/16" Cleveland "A"
1" National Acme RA-6
1¼" National Acme R-6
6" Nat. Acme RPL-8
1½" Cone 6 & 8 spindle

BORING MILLS
5" Ohio horizontal table type
36" Bullard "spiral drive"
6B Swiss (Sip) Jig Borer

DRILLS
3 spdl. Edlund #3 M.T. center, spdl. has tapping
3" cap. Baker 314 #5 M.T.
4BL Natco Holesteel, 27 spdl.
30 HO Baker 2 spdl. inverted Heavy duty

GRINDERS
6x18" Norton plain cyl.
10x18" Cinc. Ext. cyl. Model EA
10x36" Cinc. Cyl.
14x72" Hill-Clarke Norton cyl.

GRINDERS (Cont.)
24"x240" Norton Model A Roll
No. 16/38 Bryant internal
18x120" Mattison surface
124 Gardner horiz. disc
10G Sellers drill grinder
91A Covel Univ. cutter & tool
No. 17 Gleason hypoid gear grinder

LATHES—TURRET
12x48" Sheldon, never used
3A Ledge & Shipley duomatic
No. 2 Simmons 1½" cap.
No. 3 & 5 B & O univ.
No. 4 & 5 Midlands
No. 4 Gisholt bar & chucker
2G Morey 1" cap.
2L Gisholt 16"
3A & 4A Warner & Swasey

MILLERS
Univ. Milling Head for #2 Cinc.
No. 2 Kempsmith plain
No. 3 Kempsmith Univ.
No. 2H K & T Plain
No. 12 B & S production
12/24 K & T Simplex prod.
1404 K & T prod. bed type

PRESSES—PLANERS
75 T. Farquar Hyd. Forming, 48" str.
125 T. Cleve. 26x26", 7" str.
150 T. 306½ Bliss 5/5 5" st.
200 T. Clearing SA ECC, 26" st., 36"x42"
400T Bliss Hydro-dynamic 37x40", 36" str.
1500T Hyd. HPM, 48x48", 12" str.
1000T Bliss Knuckle joint embossing
12½x14'3"x36' Mesta Planer

Monarch "C" 12"x30" Actual Swing 14½" (1944)

MISCELLANEOUS
96" Ohio Rotary Table
No. 31 & No. 33 Excello Thread grinders
No. 50 Excello Precision Thread grinders

T. R. WIGGLESWORTH MACHINERY COMPANY
1719 SUPERIOR AVENUE • • • SUPERIOR 8727 • • • CLEVELAND 14, OHIO

LATE TYPE—READY TO USE

GRINDERS
No. 2 Cincinnati Centerless, in & thru feed
No. 2 Cincinnati Univ. Tool & Cutter
No. 10 Blanchard, 36" chuck, A.C. M.D.
No. 13 Brown & Sharpe Univ. Fully Equip.
No. 2 Brown & Sharpe Univ. (2)
No. 2 Brown & Sharpe Surface, M.D. Chuck (2)
6"x18" Norton Hyd. Cyl. Type C Plain

MILLS
3" Universal Horizontal Bar, 96" bed, 40" Vert. adj. Table 40"x58" M.D.
No. 3N K & T Universal, fully equipped
No. 2K K & T Vertical, 20" Power Rotary Table
No. 2H K & T Universal
No. 2MH Cincinnati Plain, Slott., Divid. Head
No. M-1B K & T Production
No. 000 B & S Production, M.D.

DRILLS
3'9" Col. Cincinnati Bickford
4'9" Col. Morris Mor-Speed, R.A. Base
4' Western Leader Type, Table & Coolant
1 Spdle. C-Otto P.F., #4 M.T. 1½" Cap.
2 Spdle. C-Otto P.F., #4 M.T. 1½" Cap.
1 Spindle Allen #3 M.T., 12" OH, Type MSVT
4 Spdle. 2B Edlund, #2 M.T. Coolant
2 Spdle. Avey MAG. Type B, #3 M.T.

LATHES
16"x54" Reed Prent. T.A. chucks, collets
16"x78" Monarch Toolroom CY, Collets
16"x8' Carroll Jamieson GH, Timken
20"x48" American Pacemaker, Chucks
No. 1L Gisholt Univ. Turret, Bar, Chuck
Nos. 3 & 4 Gisholt Univ. Turret Bar Feed
No. 5 Gisholt Universal, Thread Attach.
Nos. 3 & 4 Warner & Swasey Universal

MISCELLANEOUS
No. 7125A Fellows Gear Shaper
24H G & E Gear Hobber
No. 3120 Niagara Shear, 10' 10 Ga. M.D.
No. 40 Heald 2-Spindle Bore-Matic
No. ½ & No. 1½ Buffalo Univ. Ironworkers, M.D.
No. ½ Buffalo Vertical Bending Rolls
9/10" NAS Acme Gridley Auto. Screw Machines, chip conveyor (2)
60" Colburn Vert. Boring Mill, 2 Heads
No. 8 Marvel Band Saw, M.D.
No. 12M Morey 2 Spdle. Profiler
20" Cincinnati Univ. Shaper

George M. Bernstein & Co.
16 SOUTH CLINTON STREET, CHICAGO 6, ILLINOIS

USED MACHINE TOOLS
IMMEDIATE DELIVERY
Bliss Consolidated #56 Trimming Press
1940 Machine Shearing Attachment
2—Zeh & Hahnemann #4 O.B.I. Presses
Zeh & Hahnemann #6 O.B.I. Press
Waterbury Farrel Four Post Blanking Press #2—40 Ton
Waterbury Farrel—#2-18 Slitter with Scrap Chopper—Recoiler & Winder
Brown & Sharpe #2 Sur. Grinder, Serial #16000
Doall ML-16 Contour Saw M.D.
LeBlond 15"x5' Regal Lathe M/D T.A.
LeBlond 12"x4' Regal Lathe M/D T.A.
2 South Bend 14½"x8' M/D Lathes
South Bend 16"x8' M/D Lathe
American 24"x12' G.H. Lathe
Putnam 42"x50' G.H. A.C. Lathe M/D
Cincinnati #2MH Plain Miller, M/D
Fosdick 8'-19" Column Radial Drill
Cincinnati Bickford 5'-13" Column Radial Drill
5 Abrasive #3 Surface Grinders M/D
Pratt & Whitney 10" Vertical Shaper
Gisholt #3—#4—#5 Univ. Turrets
Warner & Swasey #1A Turret Lathe
New Britain-Gridley 6 Spindle 2¼"

This is just a partial list

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5 FT. RADIAL DRILL
15" Column, AC motor on arm, md pump, new in 1941, in storage since 1945.
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ATTENTION EXPORTERS!
Unusual opportunity to procure modern Fellows Gear Shapers 015A and 045 as well as 12" Gleason Generators, 36 BM Gould & Eberhardt Rougher, #7 Fellows Gear Shaper, #15 D. & W. Whitton Machine. Write for full information.
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330 W. 42 St., N. Y. 18, N. Y.

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Wickes Bros. Lathe 36x18' variable speed 10 H.P. motor Sundstrand hyd. equipment, hack roller rests used less than 3 yrs. Like new metal forming machine. Rots. former, hyd. operated, bending and forming for tubing, solids, extrusions. All machines in new condition.
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EMERMAN *Machinery*

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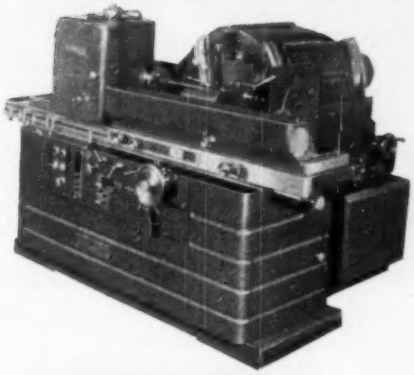


SADDLE TYPE TURRET LATHES

1A WARNER & SWASEY 2½" Hole —latest

1A WARNER & SWASEY 2½" Hole

1L GISHOLT 2½" Hole

2A WARNER & SWASEY 3½" Hole

2A WARNER & SWASEY 3½" Hole —latest

3A WARNER & SWASEY 6" Hole —latest

3A WARNER & SWASEY 6" Hole

3L GISHOLT 5" Hole—cross sliding turret

18" LIBBY 4" Hole

21" LIBBY 4" Hole

26" LIBBY 8¼" Hole

H-5 LIBBY 5¼" Hole

No. 2 ACME 2½" Hole

No. 3 ACME 4" Hole

No. 2B FOSTER 3¾" Hole

4A WARNER & SWASEY 7½" Hole

4A WARNER & SWASEY 8" Hole —latest

No. 35-L EX-CELL-O PRECISION THREAD GRINDER SER. #1598

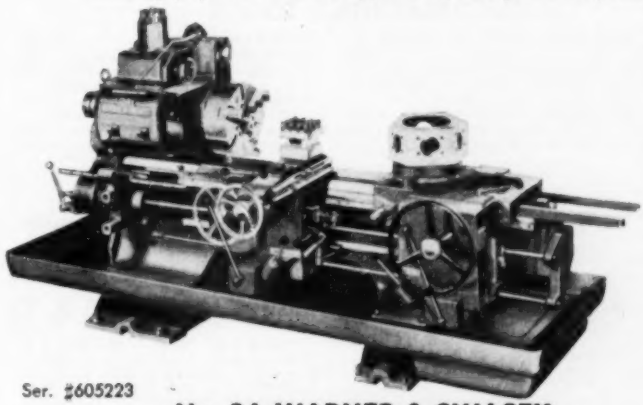
Max. dia. of work ground (with 14" wheel) 12"
Max. dia. swing over table 14¾"
Max. work length between centers 48"
Grinding wheel size 18" dia. with 9" dia. hole ⅜" and ½" thick
Grinding wheel motor 3 H.P. 1800 R.P.M.
Main driving motor 3 H.P., 1200 R.P.M.
Work spindle speeds, grinding 2 to 160 R.P.M.
Work spindle speeds, rapid traverse 2 to 250 R.P.M.
Max. helix angle setting of wheel 45 deg. left hand threads
Max. helix angle setting of wheel 30 deg. right hand threads
Maximum inside diameter of work ground 8"
Over all height 72"

Extra equipment:

Universal cam type dresser
Internal grinding attachment, with dresser and quills
Refrigerator type oil cooling unit
Wheel thinning attachment
Wheel balancing stand and arbor
Suction hood

Monthly Rental $270.83

monthly payments can be applied against purchase price



Ser. #605223

No. 2A WARNER & SWASEY HEAVY DUTY TURRET LATHE

Preselector head
Bar Capacity: round 3½"; square 2-7/16"; hexagon 3"
Swing over way covers 20"
Maximum distance end of spindle to face of hexagon turret 51⅝"
Equipped with: bar feed, tooling, 15 HP, 3 phase, 60 cycle, 220/440 V, 1155 R.P.M. Louis Allis motor

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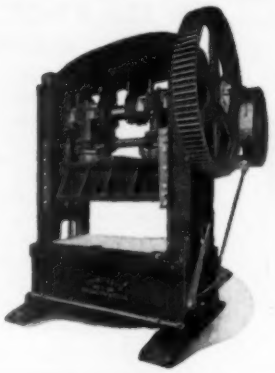

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NILES 6'x17" Radial Drill M.D. on Arm $1250
Gleason Lathe 32"x14' Cullman M.D. 650
NORTON 6x18" Hydr. Cyl. Grinder Mfg. 43 .....
FOSDICK 6'x15" Radial Drill M.D..... 1450
FELLOWS Gear Shaper Type 6..... 450
BROWN & SHARPE #3B Miller M.D... 750
CONE 8 Spindle automatic 1⅞"..... 2750
CLEVELAND 6¾" Chucker M.D..... 850
BULLARD 60" Vertical Boring Mill.. 950
4 J. & L. 14" Bench Comparators Each 250
PEERLESS 7x7" Univ. Hydracut Hack Saw M.D. 650
CINCINNATI 24" M.D. Shaper B.G... 750

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HONING—No. 249 Barnes, Hyd., 9" Bore, 16" Stroke (1940).
LATHE—48"x20' c/c Betts-Bridgeford, PRT. '41.
LATHE—36"x25' c/c Niles, 2 Carr., PRT '43.
PLANER—30"x30"x8' N.B.P. Rev. M. Dr. 3 Hds.
PLATE PLANER—30'x1" Cleveland
TURRET—No. 3L Gisholt, Chucking, Hardened Ways.

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CRANES—Milwaukee 30 T 95' span (New)
Milwaukee 10 T 85' span (1942)
Alliance 15 T 69' span (aux. hoist)

ROLLS—Bending, 30'x¾", Pyramid Bending, 15'x3" Vertical, Pyramid Bending, 11'x¾" Initial

TURRET LATHE—#3L Gisholt (1942)

PLATE EDGE PLANER—32'x2"

PLANER—N.B.P., 48"x48"x26', 4 Heads

MILLER—K. & T., #4K, Plain Horiz. (Late)

SHEARS—7'x1", 8'x1½"

PRESSES—Z & H #7 50 ton, Percussion
Bliss #6, 125 ton, (late)
Clearing, 200 ton, (late)
Bliss #310, 450 ton

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Colburn 62" Hvy. Duty Vertical Boring Mill
G & L and Universal 3" Bar Horiz. Boring Mills
Campbell 9" Cap. M.D. Abrasive Cut-Off Mach.
Moline 6-Sp. Hole Nog Drill, Barnes 4-Sp.
20" All Grd. Camel Back Drill
Cin-Bick 3' & Morris 3½' Arm Radial Drills
Do-All 8 x 24" Horiz. Sp. Hyd. Surface Grinder
Blanchard M.D. Vert. Sp. Surface Grinder 20" chuck
L & S 20" x 8', 18" x 12', 20" x 18', 28" x 12'
Monarch 20" x 8', Amer. 20" x 12' grd. hd. q.c.g. m.d. Engine Lathes
B & S Nos. 2-B & 3-B, Cin. No. 3 Mil. No. 2-B & 3-B, Cin. No. 5, LeBlond No. 4, Grd. Hd. Plain Millers
B & S No. 2-A & 3-A, Mil. No. 2-B, Cin. No. 1-M, Cin. No. 2, Grd. Hd. Univ. Millers
Avey 2-Spindle MAG Drill Press late.
Niagara 12" Power Square Shear, 10-Ga. 18" gap late.
Cin. 24" M.D. Univ. Shaper.
Cleveland 48" x 12' Table Open-side Planer, 3 Hds.

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AUTOMATICS

1⅝" Greenlee 6 spindle
1⅝" New Britain No. 61, 6 spindle
1⅞" Conomatic 8 spindle
2⅝" Acme Gridley Model RA6
No. 16 New Britain 6 spindle
No. 5DE2 Potter & Johnston

BORING MACHINES

Vernon Jig Borer
No. 2 Pratt & Whitney Jig Borer
Nos. 47A & 48A Heald Boromatics
No. 49 Heald double end
Nos. 112B & 2112 Excello
3¾" bar No. 32 Lucas horizontal
4½" bar, No. 33 Lucas horizontal
24" & 36" Bullard vertical turret
52" King vertical
100" Niles Bement Pond heavy pattern

BROACHES

No. 1 Foote Burt vert. duplex surface
10 ton 36" stroke Colonial duplex surface
15 ton, 36" stroke American duplex surface
No. 3XA Oilgear horizontal hydraulic
10 ton 72" stroke Colonial horiz. hydraulic
30 ton 48" stroke American vertical hydraulic

DRILLS

20", 21" & 24" Cincinnati Bickford
Nos. 121, 310 & 315 Baker Heavy Duty
No. 917 Baker 3 spindle
No. 30 HO Baker 2 spdl. inverted
21", No. 210 Barnes 4 spindle
18" Allen 6 spindle No. 2
15" Avey with Aveydraulic feed
24" No. 4B Edlund power feed
24" Foote Burt 6 spindle No. 2
24" Ikenco 4 spindle No. 3
24" Allen 4 spindle No. 2
8 to 42 spindle Natco multiple
12 spindle Baush roll type
4' Hammond radial, type G
4'-11" Cint. Bickford universal
6'-15" Dreses radial

GEAR MACHINERY

Nos. 3, 12, A & T Barber Colman
Nos. 8H, 12H, 16HS & 18H G. & E.
No. 130 Cleveland Rigid hobber
Nos. 1, 5A & 5AC Lees Bradner
24"x12" Fiather auto. spur
Nos. 8 & 72 Fellows shapers
No. 5M Adams hobber
9" Gleason spiral generator
No. 7 Gleason cutter grinder
Gleason testers & lappers
8"-12" Red Ring shaver
8" Red Ring lappers
No. 8M Fellows Red Liner checker

GRINDERS

4"x18", 6"x18", 10"x18" & 14"x36" Landis
8"x18" No. 10 B&S electric hydraulic
6"x18", 10"x36", 10-14"x72" & 23"x36" Norton
No. 115 Gardner opposed disc
Nos. 214 & 230 Hanchett opposed disc
53", No. 372 Besly horiz disc
28", No. 228 Gardner disc
Bryant internal, Nos. 16A16, 16CP16, 16-28, 16F28, 16-38 & 24-36
Heald internal, Nos. 74, 75A, 72A3 & 72A5
No. 72A3 Heald Sizematic centerless
No. 72A3 Heald Sizematic
14"x36" P. & W. vert. surface
No. 34 Abrasive vertical surface
6"x18", No. 2B B. & S. surface
6"x24", No. 78 Wilmarth & Morman surf.
8"x22" No. 3 Abrasive surface
No. 10 Blanchard rotary surface
12" & 16" No. 22 Heald rotary surface
16" & 24", No. 25A Heald rotary surface
12" Walker "tub" rotary surface
6" Pratt & Whitney "tub" surf.
No. 2 Cincinnati centerless
No. 2 Cincinnati tool & cutter
No. 2 Norton univ. tool & cutter
No. R6 Keller radius & tool
No. 510 Oliver drill
No. 10G Sellers drill
No. 4T Sellers tool
No. 2 Oliver ARC Cutter

LATHES, ENGINE

14"x8' Lodge & Shipley
16"x5' Monarch
16"x5' Sebastian
16"x10' American
18"x8' Hendey
19"x8' Leblond
20"x8' Lodge & Shipley
25"x48" ctrs. Leblond
36"x18' Bridgeford

LATHES, TURRET

24" & 36" Bullard vertical
Nos. 2, 3, 4, 1A & 3A Warner & Swasey
Nos. 3, 4, 5, 3AL & 2B" Gisholt
No. 2 Jones & Lamson
1"x36" & 4"x36" Jones & Lamson
No. 2 FU Foster Fastermatic
Nos. 2G & 3 Morey
No. 4 Midland

MILLERS, KNEE TYPE

No. 2H Kearney & Trecker univ.
No. 3 Cincinnati universal
Nos. 2AS & 3B Milwaukee plain
Nos. 2H & 3H Kearney & Trecker vert.
Nos. 2M, 2, 3 & 4 Cincinnati vertical
No. 3 Kempsmith Maximiller vert.
No. 3 Van Norman duplex

MILLERS, MFG.

Nos. M18, M24 & 12-24 Kearney Trecker
No. 18—12" Kearney & Trecker
Nos. 2B, 1-18, 2-18 & 2-24 Cint. automatic
No. 0B Cincinnati vertical
No. 0B & 2-18 Cint. Rise & Fall
Nos. 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 & 56-96 Cincinnati Hydromatic
Nos. 1, 1M, 2 & 3 Kent Owens
18" & 24" Cincinnati plain auto.
18", 24" & 48" Cincinnati duplex
No. 31 DeVlieg 2 spindle
30", 42" & 84" Ingersoll rotary
30" Newton rotary
48"x21"x20' Ingersoll planer type
Types C & D Hall planetary
Nos. 4, 8, 40 & CT 36 Lees Bradner

PRESSES

No. 3 Consolidated OBI
No. 6 American Can OBI
Nos. P1, P2, P3, P4, P5 & PG5 Ferracute
No. 11 Toledo horning
No. CA4 Ferracute horning
No. 32 Toledo punching
Nos. 10, 73½, 75½ & 304 Bliss S.S.
No. 56 Toledo straight side
No. 267 Hamilton straight side
No. F1356-42 Clearing S.S.
No. 506 Bliss, roll feed
No. 52 Toledo arch frame
Nos. 11½ & 11½C Bliss cam draw
48" No. 93½C Toledo double crank
48" No. 205C Toledo D.C. adj. bed
600 ton, No. 2316½ Hamilton forging
150 ton No. EG52 Ferracute coining
1000 ton No. 668 Toledo coining
1000 ton Baldwin Southwark hydraulic
100 & 150 ton HPM hydraulic
75 ton Baldwin Southwark hydraulic
35 ton Metalwood hydr. straight
10 ton Oilgear gooseneck
8 ton Fox C frame hydr.

SHAPERS & PLANERS

6" Pratt & Whitney vert. shaper
20", 24" & 28" Gould & Eber. shapers
20" & 24" Gemco univ. shapers
24" Columbia univ. shaper

SHEET METAL TOOLS

10'x3/16" Stamco gap sq. shear
72"x14 ga. Wysong & Miles shear
60" thr. Pettingell rot. shear
8'x10 ga. No. 184 D & K brake
Nos. 1 & 2M Pettingell hammer
Yoder double hammer units
Nos. 1 & 10 Macee wirers
F24 Yoder double seamers

TAPPERS & THREADERS

1½", No. 11 Murchey threader
2" Landis pipe machine
Nos. 1 & 2 Bakewell tappers
Nos. 2, 2X, 2BG Garvin tappers
Baush radial tapper

UPSETTERS, ETC.

2" National upsetter
4" Ajax upsetter
⅜"x7", No. 30 W.F. cold header
No. 18 Kane & Roach str. rolls
No. 5N Nazel air hammer

This is a partial list only. Send for complete stock list.

MILES MACHINERY CO...SAGINAW, MICH.

UNUSUAL BUYS WITH GUARANTEED PERFORMANCE

BORING MILLS

Bullard 24" Vert., Spiral Drive
Bullard 50", Vert., New Era Type Head
Bullard Maxi-Mill 54", 2 hds. on rail, Vert.
Lucas 3" bar, #1, Horiz.
Cincinnati Gilbert 3½" spindle. Latest Type
Heald #40, Single End Borematic
Heald #47 A, Boring Machine
P & H Horiz. 4" bar
Defiance #28 A Boring—Drilling, 3¼" bar
Defiance #6, 4½" bar

BULLARD 42" LATE TYPE

LATHES

American 14"x6', 3 sed., SCEL
American 16"x78" Pacemaker, 27 speeds, MD
American 18"x6', 4 sed., bg., SCEL
American 18"x6', Cullman Drive
American 18"x8', 3 sed., dbg., SCEL
American 18"x8', Geared Head
American 18"x8', 5 sed., Bowl Head, BG
American 24"x10', SPD, GH, SCEL
American 24"x12', 8 speed, GH, SCEL
American 24"x14', 8 speed, GH

AMERICAN 30"x15' GH, 12 SPEED SCEL, M.D.
AMERICAN 30"x30' GH, 12 SPEED, SCEL, M.D.
AMERICAN 42"x14' BED INTERNAL FACE PLATE DRIVE GH ENGINE LATHE, M.D.

Boye & Emmes 16"x5', 4 sed. dbg. SCEL
Boye & Emmes 16"x6', 3 sed. dbg. SCEL
Boye & Emmes 16"x8', 3 sed, Lima Drive
Boye & Emmes 18"x10', M.D., SCEL
Hendy 14"x5', 3 sed. dr. SCEL
Hendy 14"x6', 4 sed. Drive all Drive
Hendy 14"x6', Model EBM, Motor driven
Hendy 16"x6', 4 sed. dbg. SCEL
Hendy 18"x8', 4 sed. SCEL
LeBlond 17"x6', spd. 12 speeds, gh
LeBlond 17"x8', 3 sed. dbg
LeBlond 21"x8', 3 sed. dbg. SCEL
LeBlond 24"x10', 3 sed. SCEL

LEBLOND 25"x12' M.D., QC, SCEL, M.D.

LODGE & SHIPLEY 14"x30" CENTERS, SELECTIVE G.H., M.D.

Lodge & Shipley 14"x5', 5 sed. bg. SCEL
Lodge & Shipley 14"x6', 3 sed. dbg. SCEL
Lodge & Shipley 16"x8', Selective G.H.
Lodge & Shipley 18"x8', spd. SCEL
Lodge & Shipley 18"x8', 3 sed. dbg. SCEL
Lodge & Shipley 18"x9', 5 sed. dbg. SCEL

LODGE & SHIPLEY 20"x8' GH, SCEL, M.D.

Lodge & Shipley 20"x10', 8 sed. SCEL
Lodge & Shipley 24"x10', 3 sed. dbs. Turner Uni Drive
Monarch 14"x6', 3 sed. dbg
Monarch 16"x6', 6 speeds, SCEL

NILES TIMESAVER 30"x10' CENTERS DOUBLE WALL APRON

Sebastian 16"x8', 4 sed. SCEL
Sebastian 20"x8', GH, SCEL
Schumacher & Boye 36"x24', Internal Face Plate Drive
Springfield 18"x8', 4 sed. SCEL

GEAR CUTTERS

Brown & Sharpe #3—10" Automatic, SPD
Gould & Eberhardt 18M, sed. MD
Gould & Eberhardt 36R, Vert. cutter
Brown & Sharpe #3—26", MD
Fellows #615, Helical
Gleason 6" straight Bevel, MD
Gleason 15" Spiral bevel gear Generator

GRINDERS, ALL TYPES

Cincinnati #2 Centerless
Cincinnati #3 Centerless
Brown & Sharpe #13 Univ. & Tool Grinder
Covel #91A Univ. Cutter & Tool Grinder
Gardner #128A Opposed Wheel Grinding Machine
Sellers #4T Tool Grinder
Landis 4"x12" Type H Plain Cylindrical Grinder
Landis 12"x72" Plain Self Contained Grinder
Norton 14"x80" Type BA Plain Grinder
Landis 20"x220" centers, Plain Cylindrical Grinder
Landis 10"x72", Plain Self Contained
Brown & Sharpe #2 Plain Grinder
Norton 14"x48" Univ. Grinder
Landis 10"x24" Type "O" Hyd. Univ. Grinder

GRINDERS

FoCalle #35L Precision Thread Grinder
Gallmeyer & Livingston #4, Univ. Tool Grinder

TURRET LATHES

WARNER & SWASEY #5, WITH PRESELECTOR

Warner & Swasey #2, Ram type

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BAUSH W-7 Multiple Spindle Drills
NATCO 2BL "HOLESTEEL" Multiple Spindle Drill
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20"x96" AMERICAN "PACEMAKER" Lathe
50"x204" LeBLOND "BIG SWING" Lathe
32" x 36" x 66" ROCKFORD Openside Shaper—Planer
No. 2HS CINCINNATI Dial Type Vert. Miller
No. 3H KEARNEY & TRECKER Vert. Miller
No. 11 BLANCHARD Rotary Surface Grinder
12"x48' CINCINNATI Model ER Univ. Grinder
14"x36" LANDIS Type C Plain Grinder
10"-14"x72" NORTON Type C Plain Grinder
4½"x36" PRATT & WHITNEY Thread Miller
42" BULLARD Vertical Turret Lathe Spiral Drive
12"x16"x60" THOMPSON Hydraulic Surface Grinder
Model A3—16" ARTER Rotary Surface Grinder
Nos. 3, 4 & 5 WARNER & SWASEY Univ. Turret Lathes
Nos. 3 & 5 JONES & LAMSON Univ. Turret Lathes
1½" CONOMATIC Six Spindle Automatic Screw Machine

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No. 25T G. & L., 2½" table Hor. Mill, 1942
4" Univ. Table Mill, 50" vert. 96" hor., '43
36" & 42" King Side Hd. Vert. Mills, '43
Nos. 1A & 3 W. & S. Turrets, bar & chuck
Nos. 3 & 2MH Cinci. Pl. Dial Millers, late
Nos. 3K & 3H K. & T. Pl. Dial Millers, late
No. 36 Van Norman Pl. Miller, recn. '43
No. 2G Kempsmith Univ. Miller, 1943 (3)
No. 2416 Keller Duplicators, late
No. 9J Gorton Duplicator & Vert. Miller (2)
12"x24" G. & L. No. 45 Surface Grinder, '42
No. 70A Heald Internal Grinder, 1942
Gear Cutter, No. 13 B. & S., spur & bevel
No. 6 M. & M. Keyseater, AC, M.D.
30"x30" cen. Axelson Lathe, T.A.
30"x120" Hanchett Plano Surface Grinder

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ACQUIRED NEW IN 1947

1 - #6 GRINDER

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9 x 9 Worthington compressors. Late type.

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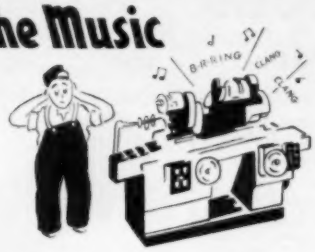

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DRILLS & RADIALS

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Avey S.S. #3 Drill Press
Baker #60 16-Sp. HD Drilling Mach.
Edlund 4 & 6 Sp. Drill Presses
Foote-Burt #2 S.S. Drill Press
Fosdick 4'11" Radial Drill
Fosdick 6'15" Radial Drill
Fosdick 4'15" Radial Drill
Natco 4AL 16-Sp. Drilling Mach.
Western 3'13" Radial Drill

GEAR EQUIPMENT

Gleason 3" Spiral Bevel Gear Generator
Gleason 12" Straight Bevel Gear Generator

GRINDERS

Arter A1—12" Surface Grinder
Arter A3—16" Rotary Surface Gr.
Blanchard #11 Rotary Surface Gr.
Brown & Sharpe #3 & #2 Univ. Grinders
Brown & Sharpe #5 Cylindrical Gr.
Brown & Sharpe #13 Univ. T&C Gr.
Brown & Sharpe #22, 10x36 Cyl. Gr.
Bryant #5 Chucking Grinder
Cincinnati 6x18 Cylindrical Grinder
Cincinnati Monoset Cutter Grinder
Cincinnati #2 T & C Grinder
Covel #15 Surface Grinder
Covel #91-A Univ. T&C Grinder
Ex-Cell-O #31 Plain Thread Grinder
Hammond #3 Gr., Buffer & Polisher
Hammond Model #10 D.E. Grinder
Hanchett #36 40" Rotary Surf. Grinder
Heald #22—12" Rotary Surface Grinders
Heald #72 Internal Grinders
Heald #81 Gagematic Internal Grinder
Heald #81 Sizematic Internal Grinders
Hill-Acme 18x60 Surface Grinder
Hisey-Wolf 4F Stand Grinder
Jones & Lamson 6"x36" Thread Grinder
Landis 6x30, Type "C" Plain Gr.
Landis 10x18 Grinder
Norton Type "C" 16x36 Plain Cyl. Gr.
Rivette #104 Internal Grinder
Thompson 6x18 Surface Grinder

SHAPERS

Fellows #61 Gear Shapers
Gould & Eberhardt 20" & 28" Shapers
Pratt & Whitney 6" Vertical Shaper
Rockford 24" Hy-Draulic Shaper
Smith & Mills 16" Horiz. Shaper

ACME-GRIDLEY
3-½" RA-6
SPINDLE
(1942)

BULLARD
36" VERTICAL
BORING MILL
(1943)

WARNER & SWASEY
#3A
TURRET LATHE
BAR FEED
(1941)

LATHES

American 20"x72" Engine Lathe
American 24"x84" Engine Lathe
Bradford 16x54" Lathe
Fitield 36"x24' Lathe
Gardner #3 Plain Polishing Lathe
Gisholt #5 Turret Lathe
Hendey 14" Engine Lathe
Hendey 14"x6' Engine Lathe
Jones & Lamson #5 Turret Lathe
LeBlond 21x7' Engine Lathe
LeBlond #4B Gun Boring Lathes
Libby 3H Turret Lathe
Lodge & Shipley #3A Duomatic Lathe
Lodge & Shipley 12x36" Engine Lathe
Monarch 20x72" Centers Engine Lathe
New Haven 84"x24' Lathe
Reid #6 Small Piece Production Lathe
Reed-Prentice 14x54 Lathe 8' Bed
Reed-Prentice 14x30 Lathe 6' Bed
Wicks 36x16' Bed Engine Lathe

MILLS

Cincinnati 1-18 Climb Mill
Cincinnati 2-18 Production Mill
Cincinnati 2-24 Mill
Cincinnati 3-24 Hydromatic Mill
Cincinnati #3 H.S.D.T. Vertical Mill
Cincinnati #3 Plain Horiz. M.S.D.T. Mill
Hardinge Vert. & Horiz. Mills
Kearney & Trecker #2 Plain Mills
Kearney & Trecker #3K Horizontal Mill
Kent-Owens #1M Hand Mill
Lees-Bradner 12x36 Thread Mill
Morey #12-M Vertical Profiler & Millers
Producto Model M Hand Mill

BORING MILLS

Betts 6" Floor Type Horiz. Boring Mill
Bullard 62" Vertical Boring Mill
Cincinnati 44" Vertical Boring Mill
Luces #31 Horizontal Boring Mill
Niles 100" Vertical Boring Mill
Rogers 36" Vertical Boring Mill

PRESSES

Bliss #303½ S.S. 35 Ton Punch Press
Bliss #58 Punch Press, 10 Ton
Ferracute 100 Ton S.S. Punch Press
HPM 150 Ton Hydraulic Press
Toledo #s-56 135 Ton Punch Press
V & O #3 Inclinable Punch Press
Jr. Minster #12—24" Press

MISCELLANEOUS

Fosdick #30-A Jig Borer
Chicago #816 Bending Brake
Foster Superfinisher 4"x8"
LaPointe Model HP-100 Hydraulic Broach, 50 Ton, 76" Stroke
Niles 90" Quartering Machine
Niagara 10'x14 Squaring Shear

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NO. 112-B EXCELLO PRECISION BORING MACHINE, Single End, Double Spdl.

NO. 216 EXCELLO PRECISION BORING MACH. Double End, Six Spindle

6 SPINDLE ALLEN NO. 2 VPF HIGH SPEED DRILL, Power Feed to Each Spindle

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12" GLEASON STRAIGHT BEVEL GEAR GENERATOR, Tool Cabinet & Equipment

NO. 6 & NO. 13 GLEASON GEAR TESTING MACHINES, Motor Drive

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NO. 2 BROWN & SHARPE VERTICAL MILL 1944 Machine, A-1 Condition

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B. & S. #6 auto. motor-in-base 2½" hole, 505 max. rpm.
Nat'l Acme RA 9/16", spdls. 6, 2885 max. rpm, tooling & attachments, (very late).
Potter & Johnson #6DRE Auto. chucker, 34" swing, 5 face turret, Timken bearing, tooling.
Cleveland 3¾" and 5¾" model "A" sgl. spdl. auto. screw, quantity of tooling (very late).

GRINDERS

Brown & Sharpe #2, 14"x30", 4, 14"x60", Universal, tooling and attachments (very late).
Cinc. 14"x72", Hyd. Universal, film brg. (very late).
Cinc. #2 and #3 centerless, film brg., long bar and auto. infeed attachment. (late).
Mattison 18"x24"x96", hydraulic, Horiz. Hi power, surface, chuck, generater, coolant, (late).

TURRET LATHES

Warner & Swasey #3, 1½" cap., #4, 2" cap. ram type Universal bar and chucking, tooling.
Jones & Lamson #5, 2½" cap. ram type Universal, rpd. trav. to cross slide, bar and chucking.
Gisholt #5, 2½" cap., ram type Universal, Preselec. hd., thread attchmt., bar and chucking, tooling.
Jones & Lamson #7A, 2½", #8A, 3", #7D, 2½", saddle type, univ., rpd. trav., bar and chucking, tooling.

BORING MILLS

Universal 4" bar "Tri-Way, Horiz. face plate to outer support 72", #6 taper, added vertical range (late).
Defiance 25A, 3¼" bar, face plate to outer support 72" #6 taper, added vert. and cross range (late).
Lucas #41, 3" bar, face to outer support 72", #5 taper. (late).
Bullard 24" and 36", "Spiral Drive" AND "new Era" type, vertical 3-jaw and 4-jaw chuck tables.

MISCELLANEOUS

Leblond 33"-60" Sliding Gap Lathe, 9' 2" C.D. Gap Closed, 14' 2" C.D. gap extended.
Cincinnati 6'x10 gauge model 1006R M.D. Power Squaring shear, extra set of blades (late).
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12"x36" Cin. Univ. Grinder

#3 Cincinnati Dial Type Plain Miller, with vertical head.

16" Rockford Hydraulic Shaper.

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Pratt & Whitney #2 Jig Borer
Cleerman Drill Press 25" Box Column, #4 M.T.
American Hole Wizard Radial 6'x15" cal.
Lolane Gilford Bicycle Spindle #2LMS
Reed Prentice 20"x8' G.H. Lathe, late type
Hendey Lathe 12"x42" G.H. Centers (1947)
Bradford Lathe 10"x8' G.H. Late
Warner & Swasey Turret Lathes #1A, #3A, #5, #5
Bardons & Oliver Turret Lathe #5, Preselector, 2"
Nersy Turret Lathes #2 & #3 Univ. (1946)
Cincinnati Universal Miller #2MH & Vert. Attach.
K & T Plain Horiz. Miller #2H, with Vert. Attach.
Van Norman Model #2L & Cincinnati #2MH Plain Millers
Cincinnati Vert. Millers #2 & #3 Dial Type
K & T Vert. Miller #3KM, with Power Rotary Table
Rowbottom Cam Miller
Do-All Hydr. Surface Grinder Model #6-7
B & S #1, & #2 Universal Grinders
Cincinnati Univ. 12"x36" Grinder, Int.-Ext.
Blanchard Vert Spindle Surface Grinder #16
Gould & Eberhardt 20" Shaper (1943—Smith & Mills 10" (1948)
Gleason Spiral & Bevel Gear Cutters 3" & 24"
Armstrong-Blum Model #9A Hack Saw, Auto. Feed
Watson-Stillman 200 Ton Hydr. Hobbing Press
Heald Plain Int. Grinder #72-A-3
Pratt & Whitney 15"x36" Tool room Lathe
K & T #3H Vert. Miller
Van Norman #3V Vert. Miller
K & T #1H-18 Mfg. Miller
Yates American #6-67 Auto Rip Saw
Lucas #41 Horiz. Precision Boring Mill
Ruesch Percussion Press #2
Lees Bradner 12"x54" Model HT Thread Miller

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½" Geo Automatic Ser. 20017
Nichols Hand Mill Ser. 5C472
Kent Owen 1-B Production Mill
South Bend 16x6 Engine Lathe
South Bend 16x6 Turret Lathe
4x12 Landis Type H Grinder
47A Heald Borematic 2 Spindle 1 End
Cincinnati 0-8 Horizontal Mill Ser. 3F1P1K-409
Norton 6x18 Vertical Surface Grinder
9" Hardinge Lathe Cabinet Base
#7½ Gardner double end Disc Grinder
Thompson #2 Automatic Profile Miller
Cincinnati 2-18 Production Mill
Sigourney 4 Spindle Sensitive Drill

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CALLAHAN No. 5—Motor Drive (New)
FERRACUTE Nos. C4 and C8
V & O Nos. 00, 0, 01, 1, 2, 4, 101, 102, 103 & 104, Flywheel & Geared, with Dial & Roll Feeds
V & O No. 5098, 900, Geared (1946)
ZEH & HAHNEMANN Nos. 36-4 & 36-5

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WATERBURY 5 Ton High Speed, Roll Feed

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BLISS 620—Double Roll Feed & Scrap Cutter, 800 strokes/min. Air Clutch. (New 1945). Also No. 675
HENRY & WRIGHT 22- & 50 Ton Double Roll Feeds & Scrap Cutters, Hooves Drive.

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BLISS NO. 7—180 TON BLANKING PRESS DOUBLE ROLL FEEDS & SCRAP CUTTER

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FERRACUTE E-3 & E-4 with Roll Feeds
FERRACUTE DG-53 & DG-54 Geared
FERRACUTE D 251 Twin-geared 250 Ton, Friction Clutch with New Air Cushion
NIAGARA No. 510 Geared with Side Shear
TOLEDO No. 30½, Twin Flywheel Forging, 400-Ton

DOUBLE CRANK

BLISS 7-60 Double Crank Press, Bed 42"x60", 12" Stroke, Air Cushions, Air Clutch, Tie Rod Frame.

BLISS—5A—42" x 30", 5C—54" x 30" Geared, Tie-rod Frame A.C. Motor Drive
BLISS Nos. 102, 103B & 106 Transfer, Gap Type
FERRACUTE 36" & 52" Geared
NIAGARA No. 67C—48" x 36", Geared Spring Cushion
TOLEDO 93½C, Bed 36" x 48", 36" Roll Feed, 3" Stroke Single Geared, M.D.
TOLEDO 92B—42"x30" Tie-rod Frame

TOLEDO 84½G Double Crank, Twin Gear, Tie Rod Frame, Bed 38"x84", Crank shaft 7" Dias 8" A.C. Motor Drive.

V & O 84"x29" with Double Roll Feed, 60 Ton, M.D.
WELLS 16—44" Gang Punches
WILLIAMS & WHITE No. 34 Gang Punch, M.D.

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MINSTER 150 Ton, Geared, M.D.
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WATERBURY 25 & 60 Ton, Flywheel
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BLISS 2A & 4A, Adj. Bed
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FERRACUTE Nos. CA-4 & CAG-4 M.D.

WATERBURY-FARREL PRODUCTION

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TORRINGTON Nos. W100, W11, W12, Universal Coilers
SLEEPER & HARTLEY Nos. 1 & 2 Torsion Coilers
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NATIONAL & PERKINS Nail Machines
WAFIOS Auto. Barbed Wire Machine
VAUGHN Nos. 10 & 12 Motobloss, M.D.
WATERBURY Nos. 3 & 4 Bull Blocks
WATERBURY Nos. 00 Sleeve type Continuous for Alum. & Copper Rod
WATERBURY-FARREL Nos. 0 & 1 Slip Roll No. 1 Slug Case
WATERBURY Nos. 1, 2 & 3 Upright Roll Continuous Wire Drawing
WATERBURY Duplex Horizontal Bull Blocks Cap. ⅝" Non-Ferrous
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WATERBURY FARREL Wire Flattening Mill, Rolls 4"x8", Water-Cooled, Roller Bearings Re-Winder (New '44)
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WATERBURY Automatic Rivet Bi-forcating Machines
WATERBURY No. 30 Inclined, Hopper Feed Thread Roller
WATERBURY-FARREL Nos. 0, 10, 20, 30, 40, 50 Thread Rollers, Hand and Hopper Feed, M.D.
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BLISS & V & O Thread Rollers & Trimmers
BLISS Double & Lock Seamers

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STANDARD Automatic Drop Hammers
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PINES ENGINEERING Tube Trimmers & Threaders Single & Double End
LANDIS 2" & 4" Pipe Nipple & Bolt Threaders
MURCHEY Tube & Pipe Cutters, M.D.
PRODUCTION MACH. Tube Polishers, Centerless
SHERIDAN 37" & 44" Die Cutting Machines, M.D.

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EXCELLO NO. 2112 SPINDLE BORING MACHINE.
PRYBIL 32"x72" Swing, Gap Type Spinning Lathe

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CLEVELAND 2½" Bar Table Type
FISHER 5" Bar Floor Type, AC—DC Drive
LUCAS #43 Precision—5" Bar Table Type, M.D.
COLBURN 48" Vertical, 2 Heads, M.D.

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BAUSCH 12 Spindle Multiple Cap. 1½"
CANEDY-OTTO 4' Radial Motor on Arm, New 1944
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FOSDICK 3½' 9" Radial Drill M.D.

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MILL—No. 1-12, 1-18 & 2-18 Cinn. Production
OIL GROOVERS—#500 Wicaco Continuous
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PRESS—No. 11½ Bliss Toggle Drawing
PRESS BRAKE—#2512 DoAll, 12' Bed, Unused
SHEAR—10'x3/16" D. & K. all steel, Squaring
TURRET LATHES—#601 Oster & 918 Rivett
TURRET LATHES—No. 3 & 4 W. & S.

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42" BULLARD, spiral drive
36-44" NILES vertical turret lathe
42" KING vertical boring mill, two heads
48" COLBURN vertical, two heads
52" GISHOLT vertical, two heads
54" COLBURN vertical, two heads
60" COLBURN vertical, two heads
61" BULLARD 'Maxi-Mill', two heads
72" COLBURN vertical, two heads
84" NILES vertical, two heads
84" BETTS heavy vertical, two heads
100" NILES vertical boring mill, two heads
100" NILES extra heavy vertical, two heads
10' NILES vertical, two heads
10' BETTS heavy vertical, two heads
12' NILES vertical, two heads
14' BETTS vertical, side head and two rail heads

BORING MILLS (horizontal)

3" spindle, #31 LUCAS
3½" spindle ROCHESTER, table 30"x52"
4" spindle LUCAS, table 30"x48"
4" Spindle #42 LUCAS, table 36"x60"
4½" spindle DEFIANCE, table 36"x64"
4½" spindle NILES 'Duplex', table 33"x60"
4" spindle DETRICK & HARVEY floor type
5" spindle DETRICK & HARVEY floor type
8" spindle NILES floor type, range—12'
10" spindle SELLERS floor type, range—18'
6" bar SIMMONS cylinder boring machine
8" bar BARRETT cylinder boring machine

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5' NATCO Holesteel Hydraulic
5' 17" column FOSDICK Hydraulic, late type
5' CINCINNATI BICKFORD
6' AMERICAN 17" column. Motor on arm
6' AMERICAN 'Triple Purpose'
6' CINCINNATI BICKFORD, motor on arm
6' CINCINNATI BICKFORD full universal
6' NILES 'Right Line', motor on arm
7' AMERICAN 'Triple Purpose', motor on arm
7' AMERICAN 'Triple Purpose',
8' NILES 'Right Line', motor on arm

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#2 CINCINNATI centerless grinder
#4" COVELL HANCHETT, type AK
24"x20" centers NORTON plain cylindrical
30"x14' LANDIS Roll Grinder
#70 HEALD internal grinder, 3 motors
#72-A/3 HEALD internal grinder
36"x13" HANCHETT, vertical surface grinder
26", #16 BLANCHARD surface grinder
30", #16 BLANCHARD surface grinder
GG-24-48 Gear Grinding Machine Co.

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36" GOULD & EBERHARDT gear cutter
48", #4 BROWN & SHARPE gear cutter
60" GOULD & EBERHARDT spur bevel gear cutter
18" GOULD & EBERHARDT gear hobber
30" BIERNATZKI gear hobber
#36-H GOULD & EBERHARDT gear hobber
30" MUIR travelling head pinion hobber
15" GLEASON spiral bevel burnishing

LATHES

16"x10' (74" centers) SPRINGFIELD tool room, pan, draw-in and taper
24"x10' AMERICAN, geared head
26"x16' BRIDGEFORD
30"x10' AMERICAN 12 geared head
32"x24' NILES forge lathe, 2 carriages
36"x24' NILES internal, geared head
36"x48' BRIDGEFORD boring lathe
42"x18' AMERICAN 16 speed
42"x16' WICKES 16 speed
42"x32' AMERICAN 16 speed, 2 carriages
42"x42' (30' centers) NILES heavy, 2 carriages
48"x44' BRIDGEFORD boring lathe
50"x50' PITTSBURGH, 2 carriages
50"x73' (60' centers) PITTSBURGH, 2 carriages
60"x45' SIMMONS, 2 carriages
14'x50' NILES
30/45"x127" centers NILES gap type axle lathe
#2 NILES center drive axle lathe
PUTNAM center drive axle lathe
90" PUTNAM driving wheel, quartering
90" NILES combination turning, quartering pin turning

MILLING MACHINES

#3 KEMPSMITH plain, table 58"x14"
#4-B KEARNEY & TRECKER plain
#4 CINCINNATI 'High Power' plain
#5-B BROWN & SHARPE plain
#5 KEMPSMITH plain
#5 CINCINNATI heavy plain
#2 CINCINNATI vertical, adjustable head
#3 CINCINNATI vertical, adjustable head
#4 CINCINNATI vertical, adjustable head
30"x24"x12' INGERSOLL Planer Type
48"x48"x14' INGERSOLL planer type, four heads
48"x56"x18' INGERSOLL planer type, three heads
72"x60"x20' INGERSOLL planer type, four heads
72"x72"x30' INGERSOLL planer type, four heads

PLANERS (standard)

36"x36"x8' GRAY, two heads
36"x36"x10' CINCINNATI, two heads
36"x36"x14' GRAY, four heads
48"x48"x12' DETRICK & HARVEY extra heavy, 3 heads
48"x48"x18' DETRICK & HARVEY extra heavy, 3 heads
48"x48"x24' NILES, 3 heads
48"x48"x32' GRAY, four heads
56"x30"x20' CONSOLIDATED heavy guide planer
60"x60"x16' BETTS heavy, 4 heads
60"x60"x18' NILES heavy, 3 heads, 230 volt DC
72"x72"x18' NILES, four heads, 230 volt DC
84"x75"x20' DETRICK & HARVEY, 3 heads
136"x96"x30' SIMMONS, 4 heads, P.R.T.
16'x12'x35' NILES variable voltage drive 4 heads

PLANERS (openside)

36"x36"x10' CLEVELAND, 3 heads
48"x42"x16' DETRICK & HARVEY, 1 side head
60"x60"x18' DETRICK & HARVEY, 3 heads
72"x72"x24' DETRICK & HARVEY, 3 heads
9'x15'x35' DETRICK & HARVEY, 4 heads
60" NILES rotary planer
30' LOUDON plate planer and beveler
#3 NILES plate planer, 230 volt DC

PRESSES, PUNCHES & SHEARS

600 ton NILES driving wheel press
#3 LONG & ALSTATTER shear, ⅜"x8"
#5 LONG & ALSTATTER punch, ⅝"x5½"
CLEVELAND punch, 1"x1"
JOHN MOHR shear, ¾"x8"
#5 HILLES & JONES punch, 1¼"x11½"
#2 LONG & ALSTATTER, double end
165 ton Straight Side shear, guillotine type
No. 3, 3½"x3½"x¾" LONG AND ALSTATTER Angle Shear

SAWS, SHAPERS & SLOTTERS

60" NEWTON cold saw, 35 HP motor
120" NEWTON type U-97/A cold saw
26" MORTON draw-stroke shaper, 230 volt D.C.
32" CINCINNATI crank shaper
36" MORTON draw-stroke shaper
6" PRATT & WHITNEY vertical shaper
15" NEWTON crank slotter
18" DILL slotter, 34" table
25" JONES slotter, 45" table
30" BAKER draw stroke slotter and keyseater
68" NILES geared slotter, 74" diameter table
84" NEWTON portable slotter cross feed 48"

TURRET LATHES

NEW No. 2 BG SIMMONS Micro drive 1¼" bar capacity.
#2 SIMMONS 1¼"x12" back geared, bar feed
#1-A WARNER & SWASEY universal, 2½"x13", chucking
#3-AL GISHOLT, 6¼" hole, 27" over ways, 22" four-jaw chuck
#2-H-10 LIBBY 'International', 10¼" hole, 27" over ways, 22" 4-jaw chuck
26' LIBBY, 7½" hole, 26" over ways, four jaw chuck

MISCELLANEOUS

10'1¼" Robinson bending brake
12' HILLES & JONES #6 flanging clamps
#2 PRATT & WHITNEY jig boring machine
KELLER type BG-724 die cutting machine
#3 BAKER keyseater, 24" stroke
48" stroke MORTON keyseater to 3"
20'x¾" Wickes pyramid bending rolls, drop end

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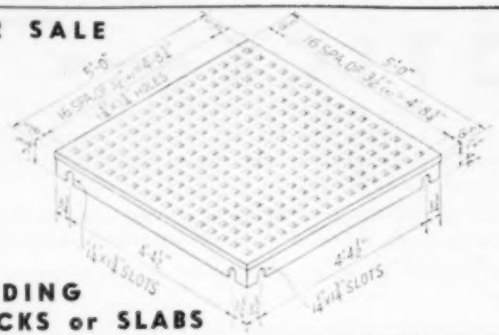

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BAKER 36" Heavy Duty Drill, cap. 5", #6 M.T., gear box drive
WARNER & SWASEY #5 Ram Type Universal Turret Lathe, preselector head, late type
WARNER & SWASEY Universal Ram Type Turret Lathe, preselector head, late type
LIBBY Model 1H-6, Heavy Duty Turret Lathe, 6" hole, Timken bearings, late type
CINCINNATI 48"x48"x12' Planer, box table, 4 heads
TOLEDO #79 Gap Frame Press, 150 tons cap., M.D.
HILLES & JONES 54", Gap Shear, ¾" cap., M.D.
NAZEL #2B Forging Hammer, M.D.

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No. 2B-U Van Norman Universal Miller. (Mfg. 1942).
No. 2 B. & O. Geared Electric Turret Lathes. (1938 & 1948).
M-2 Barnes Hydram self oiling Drilling & Reaming Machine. '37.

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before U.S. Patent Office, Validity and infringement investigations and opinions. Booklet and form 'Evidence of Conception" forwarded upon request. Lancaster, Allwine and Rommel. Registered Patent Attorneys, Suite 453, 815-15th Street, N. W., Washington 5, D. C.

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#41 Lucas Horizontal Boring Machine
#32 Lucas Horizontal Boring Machine
#50 Giddings & Lewis Horizontal Boring Mill
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36" Bullard Vertical Turret Lathe
42" Bullard Vertical Turret Lathe, New Era
42" King Vertical Boring Mill
#48 Heald Borematic, Double End
#47-A Heald Borematic, Single End
#46-B Heald Borematic, Double End

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#30-HO Baker Heavy Duty Drill
#2-BL Natco Multiple Spindle Drill
4' 12" Column American Radial Drill
6' 17" Column American Radial Drill
#2 Avey 4-Spindle Sensitive Drill, Aveymatic Feeds
#2 KH Allen 6-Spindle Sensitive Drill
#4 BM Foedick Upright Drill
#200 Defiance Upright Drill
#68 D Moline "Hole Hog" Hydraulic Feed Driller

GRINDERS—CYLINDRICAL

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4" x 12" Landis Plain Hydraulic Cylindrical Grinder
6"x18" Norton Type C Plain Cylindrical Grinder
6"x18" Cincinnati Model ER Plain Cylindrical Grinder
10"x18" Cincinnati Model ER Cylindrical Grinder
10"x36" Cincinnati Model EA Cylindrical Grinder
16/20"x72" Norton Type C Cylindrical Grinder

GRINDERS—INTERNAL

#5-A Bryant Hole and Face Grinder
#16-16 Bryant Internal Hydraulic Hole Grinder
#16-28 Bryant Internal Hydraulic Hole Grinder
#72-A Heald Plain Internal Grinder
#72A3 Heald Plain Internal Grinder, Cross Sliding Head
#72A5 Heald Extended Bridge Internal Grinder

GRINDERS—SURFACE

6"x18" Norton Vertical Spindle Surface Grinder, New Machine
#34 Abrasive Vertical Spindle Surface Grinder
#10 Blanchard Rotary Surface Grinder
#11 Blanchard Rotary Surface Grinder
#16 Blanchard Rotary Surface Grinder
#18 Blanchard Rotary Surface Grinder
#22 Heald Rotary Surface Grinder
#25-A Heald Rotary Surface Grinder

GRINDERS—UNIVERSAL

10"x24" Landis Type C Universal Grinder
#2 Brown & Sharpe Universal Cylindrical Grinder
#3 Brown & Sharpe Universal Cylindrical Grinder

GRINDERS—MISCELLANEOUS

#13 Brown & Sharpe Tool & Cutter Grinder
#214 Besley Double End Disc Grinder
#7 Badger Double End Disc Grinder

LATHES

14" x 6' Bed Hendey Geared Head Engine Lathe
18"x72" Centers Monarch Geared Head Tool Room Lathe
28"x30' Bed Bridgeford Geared Head Engine Lathe

MILLING MACHINES—MANUFACTURING & AUTOMATIC

#1-18 Cincinnati Manufacturing Type Mill
#1H18 Kearney & Trecker Manufacturing Mill
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#2-L Cincinnati Plain Horizontal Mill
#3 Cincinnati Plain Horizontal Mill
#3 Van Norman Plain Horizontal Mill
#4 Cincinnati Dial Type Plain Horizontal Mill
#5 Cincinnati High Power Plain Horizontal Mill

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#2-H Kearney & Trecker Vertical Mill
#2-M Cincinnati Vertical Mill, Fixed Head
#2-K Kearney & Trecker Vertical Mill
#3-H Kearney & Trecker Vertical Mill
#3 Cincinnati Medium Speed Dial Type Vertical Mill
#4-H Kearney & Trecker Vertical Mill
#4 Cincinnati High Power Vertical Mill

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#3 Warner & Swasey Universal Turret Lathe
#4 Warner & Swasey Ram Type Universal Turret Lathe, Pro-Selector
6-R Denver Acme Ram Type Universal Turret Lathe
#2 Universal Cincinnati Acme Turret Lathe
#3-A Warner & Swasey Turret Lathe
#1-L Gisholt Universal Turret Lathe

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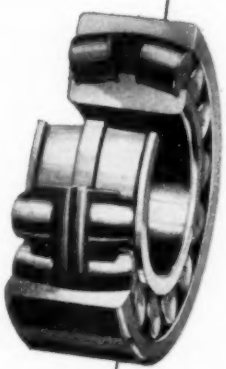

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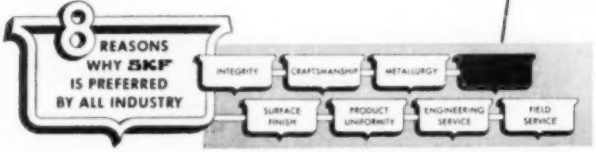

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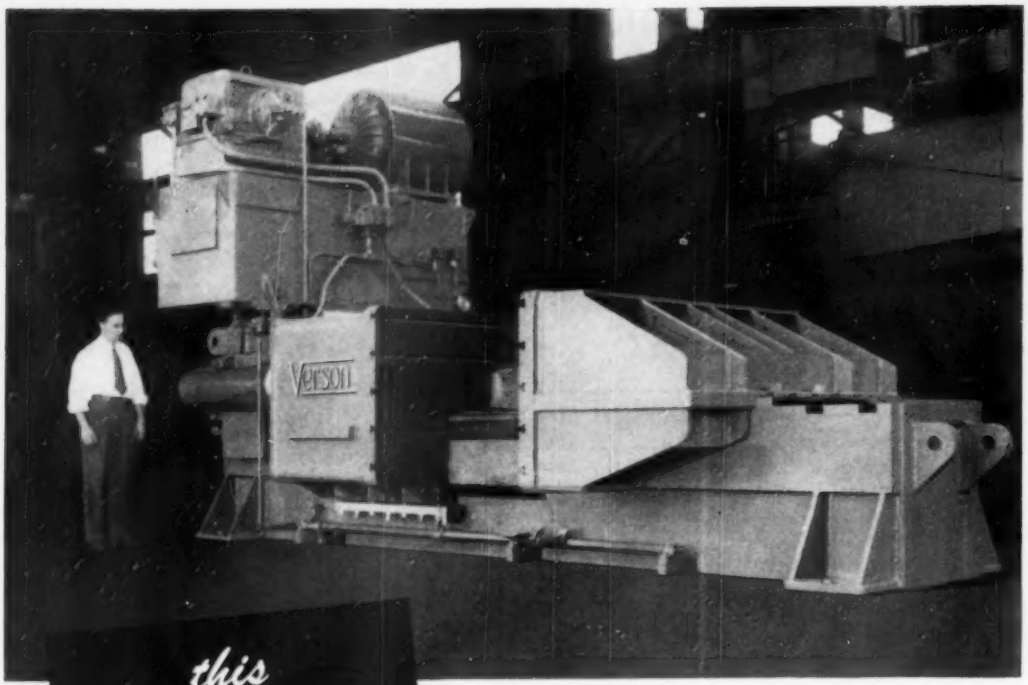

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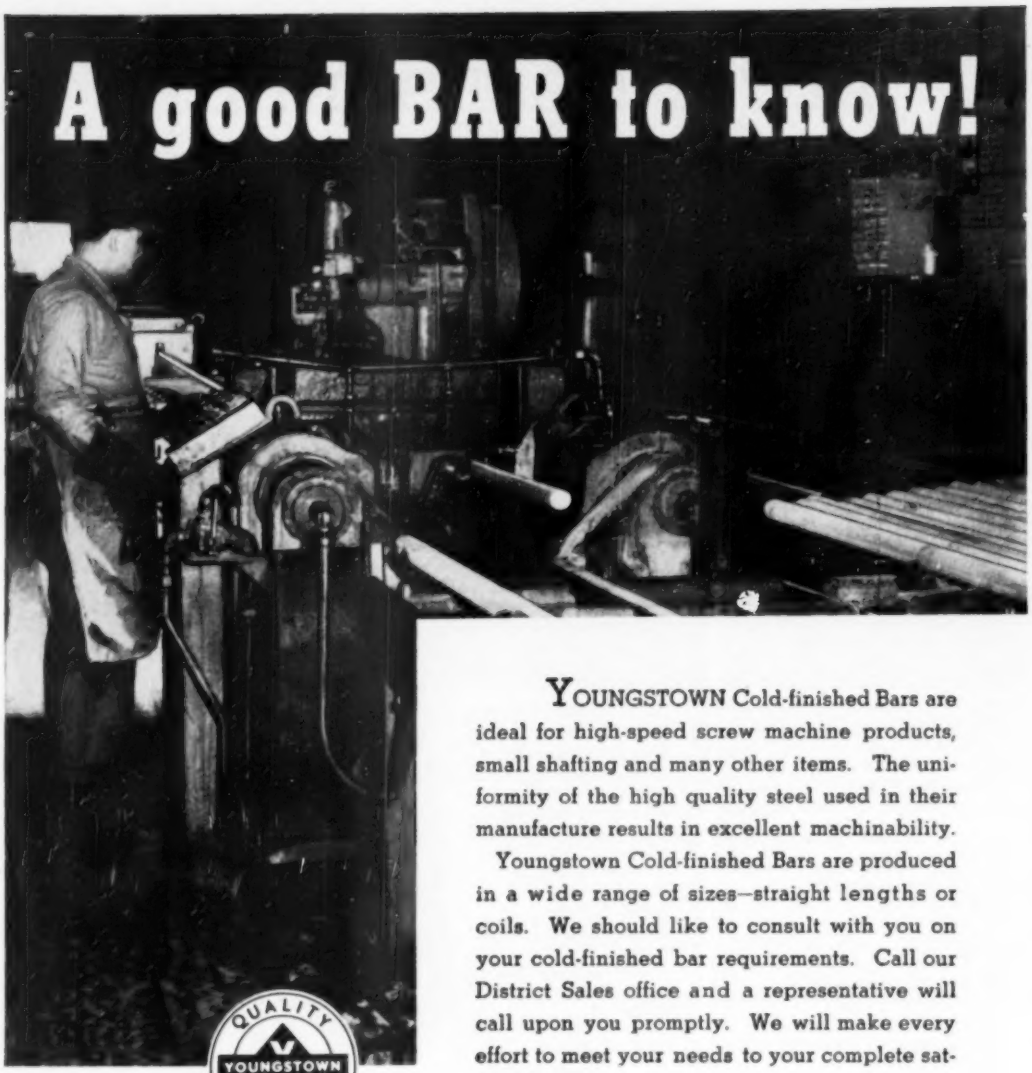

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V&O Stockmaster ROLL FEEDS

Speed-Up Production and Lower Cost-- on Any Make Punch Press!

V&O "STOCKMASTER" ROLL FEEDS are designed to meet present day needs of feeding material. They are accessible and readily adjustable within capacity to varying lengths of feeds.

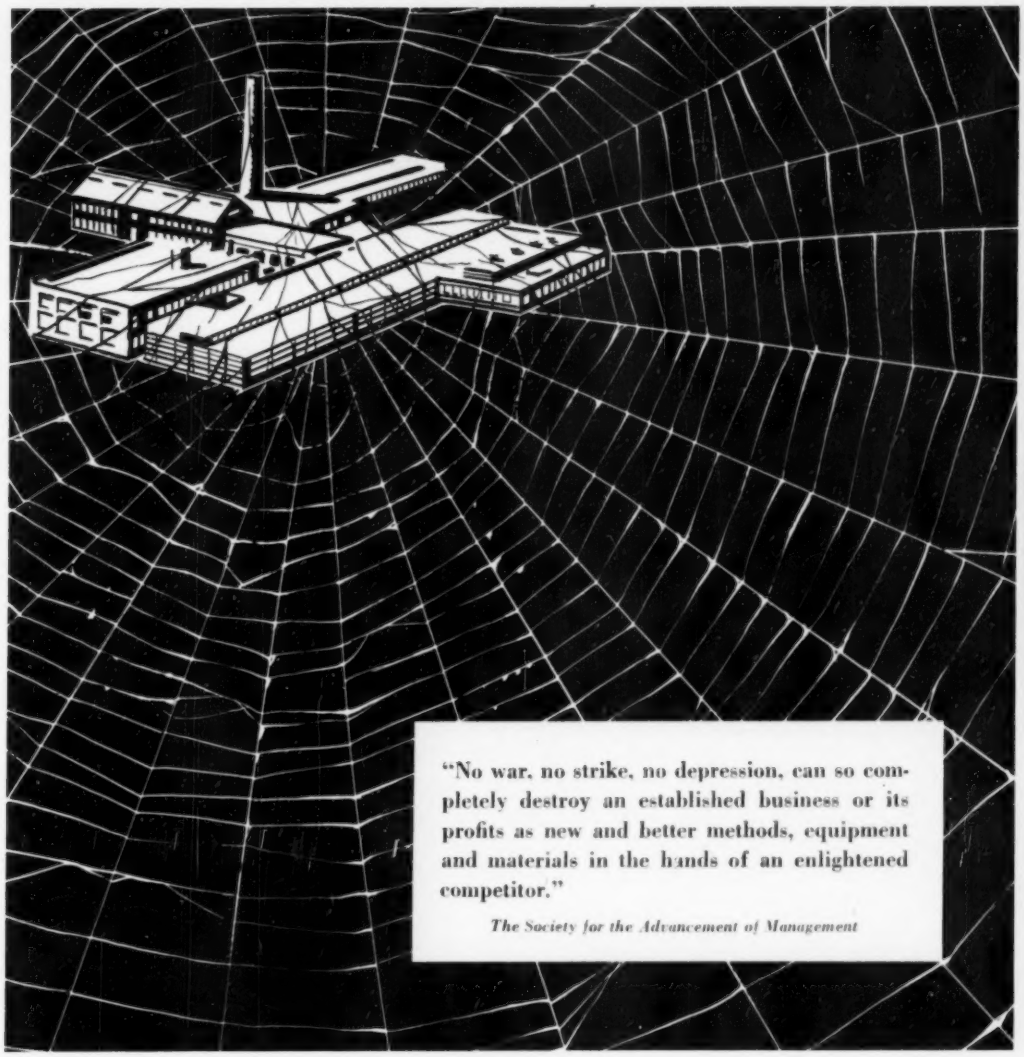
The clutch on the "STOCKMASTER" is of the friction type and will operate to a very close degree of accuracy. These ROLL FEEDS are mounted on a special bolster, which makes it possible to remove and replace the ROLL FEED UNIT from and to a PRESS without disturbing its alignment.

In addition to the V&O ROLL FEEDS, which are made in either single or double types, scrap cutters and straightening rolls can be attached as separate items — either at the time of installation or at a later date, without the need of additional bolster equipment. Also, V&O "STOCKMASTER" ROLL FEEDS are adjustable for height.

The "STOCKMASTER" FEEDS, as well as V&O STANDARD ROLL FEEDS, are applicable to other makes of PRESSES, as well as those of V&O manufacture. V&O is also prepared to supply STOCKREELS, STOCKCRADLES or other Material Handling devices. Write for details.

The Stockmaster Roll Feed as installed on a V&O No. 5 Press.

the V&O PRESS COMPANY
DIVISION OF ROCKWELL MANUFACTURING CO.
HUDSON, N.Y.



"No war, no strike, no depression, can so completely destroy an established business or its profits as new and better methods, equipment and materials in the hands of an enlightened competitor."

The Society for the Advancement of Management

Rare is the plant where no better methods can be found to protect ability to compete successfully. The New Britain Representative is a Better Methods Specialist who is at your service.

NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

New optical dividing head gets extreme accuracy with new TIMKEN® "Double-Zero" bearings!

SPEED and extreme accuracy of indexing that would be impossible with mechanical type heads are outstanding features of the OPL optical dividing head. Because the smallest bearing run-out would cause mis-reading of the precise optical system, the F. T. Griswold Manufacturing Company mounts the spindle on the new Timken® "Double-Zero" bearings—the most accurate Timken bearing ever made.

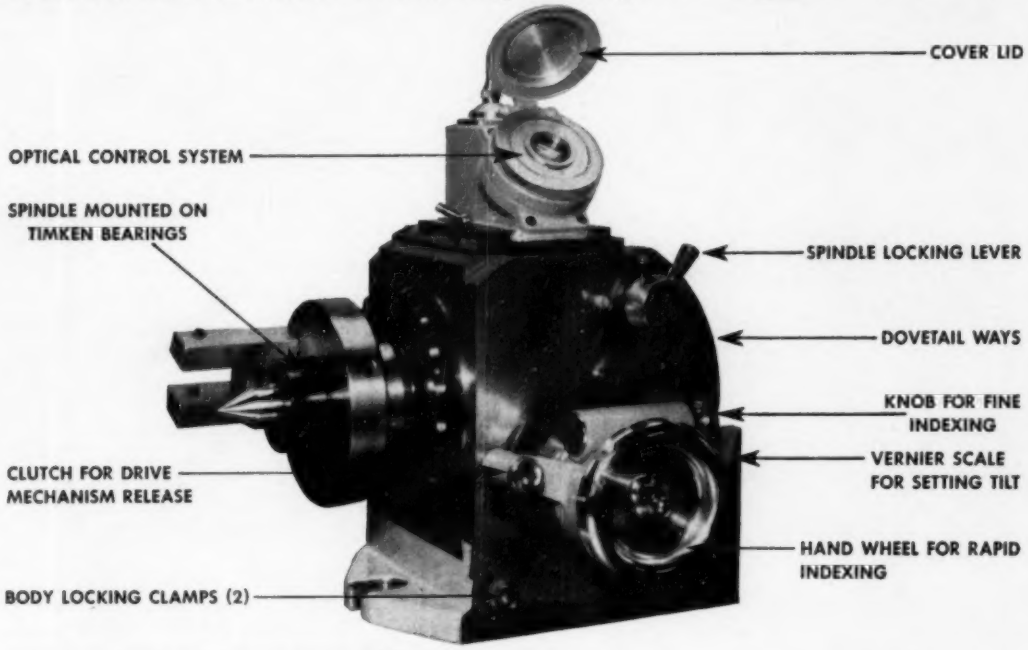
Maximum run-out tolerance in the new Timken "Double-Zero" is only 75 millionths of an inch—twice the accuracy of the Timken "Zero", previously the most accurate Timken bearing on the market.

To produce this amazing new bearing, Timken engineers have built specialized machine tools, developed measuring devices of incredible precision and perfected new manufacturing processes.

The new "Double-Zero" bearing is the latest example of Timken leadership in giving industry new standards of bearing precision. In addition to its use in this new dividing head, it is already finding a wide field of application on grinding machine spindles, gear cutters, lathe spindles and many other machines where extreme accuracy is essential.

Whatever machines you make or buy, the trade-mark "Timken" on the bearing is an assurance of fine bearing quality, long life and dependable performance. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

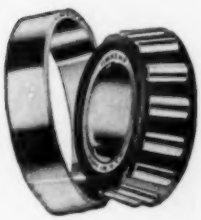
This symbol on a product means its bearings are the best.



A PRECISION TIMKEN BEARING FOR EVERY REQUIREMENT			
CLASS	"00" (Double-Zero)	"0" (Zero)	"3" (Three)
RUN-OUT	.000075"	.000150"	.000300"
TYPES AVAILABLE	Standard Single Row	Standard Single Row	All types
SIZE RANGE	Up to 10" O.D.	Up to 12" O.D.	Up to 12" O.D.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⇩ AND THRUST →⇩← LOADS OR ANY COMBINATION ✳